RAILROAD GAZETTE

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## Contributions.

### The New South Terminal Station at Boston.

Boston, Jan. 7, 1899.

To the Editor of the Railroad Gazette:

As a supplement to the very interesting descriptions of the new Boston passenger station which have appeared in the Railroad Gazette (this week, and before), your readers may perhaps be interested in a few notes made by one who attended the opening.

The exercises were very simple. The President of the Terminal Company, Mr. Charles P. Clark, gave a brief account of the work. He gave great praise to the architects, the engineer and the contractors, but took a very small part of the credit for the successful completion of the enormous undertaking to himself and his associates. But the business part of the community ascribes a large portion of the honors to Mr. Clark and his co-workers.

The Boston Terminal Co. was organized in 1896, and the Board of Trustees has held exactly 100 formal meetings. The money for the enterprise was procured by the sale of bonds, which were so conservatively issued and the redemption of which was so well provided for, that they have been largely taken by the savings banks of Massachusetts. Therefore, as President Clark expressed it, "This building, with its appurtenances, is the property of the wage-earners of Massachusetts."

Mayor Josiah Quincy drew attention to the fact that a people's advancement in civilization may be accurately measured by the condition of their facilities for transportation. Hence, by inference, the building of this station, covering fourteen acres of ground, is evidence of a great increase in the breadth and extent of Boston's culture and high development. Possibly the Mayor may find that the significance of this fact is not everywhere appreciated, for already some ungrateful people, not mindful of their high privileges, are grumbling because these modest improvements, which were expected to cost six millions of dollars, have really cost more than twice as much.

The size of this station does not impress the beholder in exactly the same way as does the Broad Street Station at Philadelphia, for example. The arrangement of offices in the upper stories for the different companies is very successful. Each corporation has, as far as possible, an entire floor to itself, hence there is no going up and down stairs for business between different departments of the same company. The parts of the station which minister to the wants of the traveling public are superior to anything ever before seen in this part of the country. Everywhere is shown the most ample provisions for the convenience and comfort of the patrons of the roads centering here; everywhere there is evidence of unsparing expense to secure these; everywhere is luxury in a good sense; but nowhere is there left on the mind the impression of extravagance or useless expenditure. Little has been spent for mere ornamentation; much has been laid out to make everything as convenient and easy of access as possible. The different departments, baggage and parcel rooms, toilets and lavatories, waiting rooms, ticket offices, etc., are all readily reached from the street or from the train house, and the general impressions (before actual experience) are exceedingly favorable.

The general waiting room will hold 1,500 or 2,000 people, and is divided into sections representing the different counties of Massachusetts and parts of Rhode Island and Connecticut reached by trains from this station. These are alphabetically arranged, and here the passenger may wait in the assurance that he will be within hearing when his train is called (for the room is so large that no voice could be distinctly heard over the whole room, even with a speaking trumpet). Of course, those who do not happen to know in what county they live, or that to which they wish to go, must brush up their knowledge of geography.

The women's retiring rooms will probably come in for as great a share of commendation as any part of the building. The size, arrangement and luxurious character of their appointments surpasses anything of this kind in any eastern city. Comfortable chairs abound, lounges for the weary are placed about the room, cribs and cradles for the babies are provided, with fine bed linen, blankets and white spreads. From this room open two lavatories, one marked "free" and the other demanding the payment of a small fee. White-capped matrons are in charge, and no first-class hotel has more modern or more serviceable appliances than are here provided for all.

Large windows abound, and the provisions for artificial illumination are no less elaborate. Just one error of design or arrangement seems to have been made, as thus far disclosed; one of the entrances from the train house to the restaurant is from the same corridor which leads to the emergency room, so that it is very possible some poor victim of an accident may be carried along this passage at the same time people are on their way to the restaurant. In no other respect does the writer know of a single unfavorable criticism, except that it is feared by some that there may be delay in obtaining incoming baggage, owing to the great size of the baggage room. It remains to be seen whether this fear is well grounded.

C. B. F.

### The Gains from and the Sociology of L. C. L. Freight.

Dec. 28, 1898.

To the Editor of the Railroad Gazette:

May I ask consideration for the following Problem?

Given a railroad doing a large bulk freight business and also a large package, less than carload, business. In order to reduce expenses, it is desired to make the best possible use of the large capacity box cars, which are loaded with hardly 20% of their total capacity when used in merchandise trade. The contrast between the proportion of dead load and paying load in this business is so great as compared with the proportion in the bulk freight business and the necessity for

(a) loading the engines up to the total engine rating, for economical hauling; and for

(b) the movement of empty cars, not as light-loaded cars, but as empty cars, for proper distribution,

is so evident that serious consideration should be given to increasing the tonnage and reducing the number of cars in L. C. L. trade. Much of this business can hardly be considered as remunerative freight, and yet it is solicited for its effect in obtaining other shipments, and the question arises, How can it be put on a paying basis?

Would it be possible as one

Solution

to confine the L. C. L. freight movement to business loaded between stations showing an average daily L. C. L. tonnage of 20,000 lbs. or over; all other L. C. L. business to be handled by independent freight companies (at rates lower than current express rates), except when the shippers or consignees of a small station can combine to obtain 20,000 lbs. of mixed freight in any one day?

Would not this policy lead to the following desired Results?

1.—Increase the average load of merchandise cars in freight service and decrease the amount of freight station labor.
2.—Simplify the methods of freight soliciting and rate making.
3.—Induce the building of special cars and adoption of special methods for the work of distributing small lot freight.
4.—Improve the time on L. C. L. business to and from minor points.
5.—Tend to divorce the L. C. L. fast service from other service and put it on a paying basis.

Of course, such a scheme will raise the following questions of

Public and Corporate Policy.

1.—Would not this readjustment of the service be seriously detrimental to small traders and their customers in small towns? But would it not also increase the distributing business of large interior towns?
2.—If advisable, would it be practicable for one system of roads alone to adopt the plan?
3.—Would it be practicable for one group of systems to adopt it?

X.

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Washington, D. C., Jan. 4, 1898.

To the Editor of the Railroad Gazette:

The proposition to classify L. C. L. freight, from points where the movement is light, as a kind of express, and make it bear a higher rate that shall in some measure compensate the railroad for what is lost through lack of density of the traffic, would seem to fall under two heads: 1. The advantages of a physical organization of the traffic in reducing cost of light loaded car movement, irregularly employed station labor and wasted mileage of specially constructed cars, or loss by use of cars not highly specialized to the traffic they carry. 2. Shall the railroad bear the expense of meeting ideal traffic conditions, which are the ever ready tender of transportation, regardless of volume and kind of business, or shall the public bear the expense in shape of a higher rate for such sparse L. C. L. business; or, in case of organization of the traffic to ideal operating conditions, shall they bear the cost in the shape of inconvenience and delay in choosing their shipping days to meet the convenience of the railroad?

Under the first head car service would be greatly benefited, and also station service, but in a far less degree. I cannot see how the methods of soliciting would be changed very much; and as for rate making, the rates would probably be farther complicated by the introduction of this new classification of private express business. Specialization of cars could go on advantageously, but I do not believe this would practically amount to very much, because the business aimed at is so very miscellaneous and not of such great volume as to offer a great margin for classification. It would undoubtedly improve the transit time of such business to hold it until a car could be made up for the destination by co-operation of the shippers, but the actual time of accomplishing the transportation would still be no less, for shippers would have to adjust their convenience to the railroad's convenience or else pay a higher price. So far as it reduced expenses, it would undoubtedly tend to put the fast freight business on a paying basis, on the principle on which all organization of work makes economy.

Under the second head, the plan would undoubtedly do violence to the interests of the small traders in small towns, and by consequence would operate so far to the advantage of the larger distributing centers. The higher rate for the special class proposed is a definite raising of rates, and it is plain that whether this is practicable is simply a question whether at competitive points the carrier can afford to lose all such business. If, as stated, this business is not remunerative, of course there is no better way of getting rid of it gracefully and within the lines of the law.

It might be open to question how far such discrimination might be construed by the courts as contrary to public policy. It is true it is a discrimination based on cost, though a feature of cost that as compared to bare miles hauled has not come in for much recognition. Because a discrimination based on cost of service it might at first thought be conceded to be unquestionably just, but a discrimination based on relative direct cost of service is an entirely different thing from a discrimination which simply makes sure that one service does not bear the direct expense of some other service. The latter is beyond all cavil, but the former is made to include those indirect costs that are entirely a theoretical thing, an intellectual notion as applied to specific things.

J. SHIRLEY EATON.

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To the Editor of the Railroad Gazette:

It looks to me as if "X," having struck a pretty tough problem, proposes as a "solution" that a company be organized to solve it. I do not think that I myself would call this a solution, but I am conscious that the weight of precedent is against me, and that "X" has on his side many eminent authorities who have solved their problems by farming out the solution to independent companies.

Our American express system is one instance of this. The railroads did not think they could afford the necessary organization to provide for the collection and delivery of packages, or for the quick transfer of packages between their baggage cars. The problem was too large for them, and so they have farmed the business out to independent express companies, which, somehow, can afford to provide the necessary facilities, and in some way are able to maintain rates better than the railroads, and which are making a very pretty penny out of the deal.

The second case is the case of the Fast Freight Lines. Here the railroads are now attempting to retrace their steps and to handle their through business themselves, but when the problem of the proper and prompt handling of through freight first came up the railroads solved it very much as "X" proposes to handle his problem. They farmed the solution of it to the fast freight companies, with the result that it was very much more to the advantage of the fast freight company than to the railroad.

The result of the farming out of the express and through freight business to express companies and fast freight lines is such that certain railroads are absolutely destitute of the proper staff for the handling of transportation problems like those presented by "X." On such roads it seems to be nobody's business to regulate the handling of high class L. C. L. freight, either in through or local trade, and when such roads are struck by the necessity for economy,

it is not at all strange that they feel unable to cope with L. C. L. problems, and wish to continue the farming out process.

To my mind this whole farming out tendency is wrong, and every railroad should be so organized as to be able to grapple with its own transportation problems.

Questions like those presented by "X" are very much more difficult, simply because a large part of the L. C. L. traffic is now handled by express companies and fast freight lines, when it ought to be handled by the railroad in connection with its other L. C. L. trade. The cream of the business is now taken by these outside companies, and there is no wonder that "X" finds difficulty in handling the comparatively low class freight traffic that is left.

I think, however, that there are many cases where the case is not quite so bad as it seems under the statement. In looking at the problem "X" seems to rate the capacity of his box cars wholly by weight when he states that his large capacity cars are loaded with hardly 20 per cent. of their total capacity when used in merchandise trade, and speaks of the contrast between the paying load in this trade and in the bulk freight business.

If you are going to consider weight alone and neglect (1) bulk, and (2) the freight rate, there is no doubt that small load merchandise business does not pay; but if "X" will take the trouble to figure up the receipts per car mile of some of the mixed cars which leave his large stations loaded full with miscellaneous merchandise for nearby points, he will find that while the weight of the shipment is only a small fraction of the marked capacity of the car, the receipts per car mile compare very favorably with shipments of bulk freight.

This fact is very inconvenient to the man who is trying to run his road on general principles and to get a high average loading for his cars; but if he is after net earnings he must not neglect this fact, and he must not frown on cars loaded full of miscellaneous freight, even if they throw a doubt on what he considers as the necessity for loading engines up to the total engine rating for economical hauling.

Again, I notice that "X" assumes another "necessity" for the "movement of empty cars, not as light loaded cars, but as empty cars, for proper distribution." This in general is a good thing, but there are many cases where it is better and cheaper to effect your car distribution by loading your cars light, as, for instance, when such a method may quicken up your local freight trains by saving time at way stations.

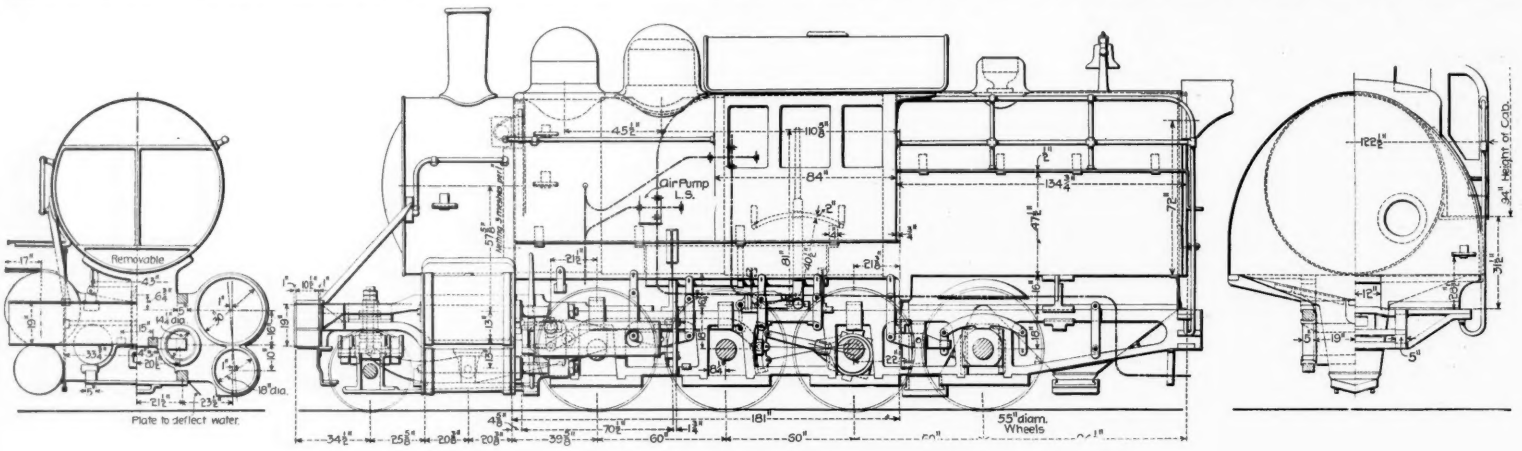
I am not at all sure that in general the L. C. L. business is not now on a paying basis. It can undoubtedly be made to pay better if it is carefully studied and intelligently handled, but that this study and handling can be done better by an independent company than by a railroad is something that I cannot see.

T. T.

## A Heavy Consolidation for the Lehigh Valley.

In our issue of Nov. 25, the leading dimensions were published of a heavy Vauclain compound consolidation locomotive built by the Baldwin Locomotive Works for the Lehigh Valley Railroad. The engravings now given show the general appearance of the engine and the details of the boiler, which has a wide firebox designed for burning anthracite coal. The outside diameter of the first course of the boiler is 80 in. There are 511 tubes, 2 in. in diameter, which furnish 3,890.6 sq. ft. of heating surface, while the firebox heating surface is 215 sq. ft., making a total heating surface of 4,105.6 sq. ft. The grate has an area of 90 sq. ft.

The cylinders are 18 and 30 in. by 30 in., the driving wheels all have flanged tires and are 55 in. in diameter, while the weight on the drivers is about 202,200 lbs. and the total weight about 225,100 lbs.; these figures include the weight of water in the boiler, but not the weight of the fire and men. A good idea of the relative size of this locomotive can be got by reference to the following table, in which the principal dimensions of a few recent locomotives are compared with corresponding dimensions of the new engine of the Lehigh Valley. The dimensions of certain other heavy freight engines were given in our issue of Oct. 28 last. The new consolidation engine of the Union Railroad, Pittsburgh, is the heaviest locomotive which has been built up to the present time, and it is therefore interesting to note how closely the Lehigh Valley Consolidation approaches this engine in weight.




Elevation of the Vauclain Compound Consolidation Locomotive for the Lehigh Valley.

Dimensions of Heavy Locomotives.

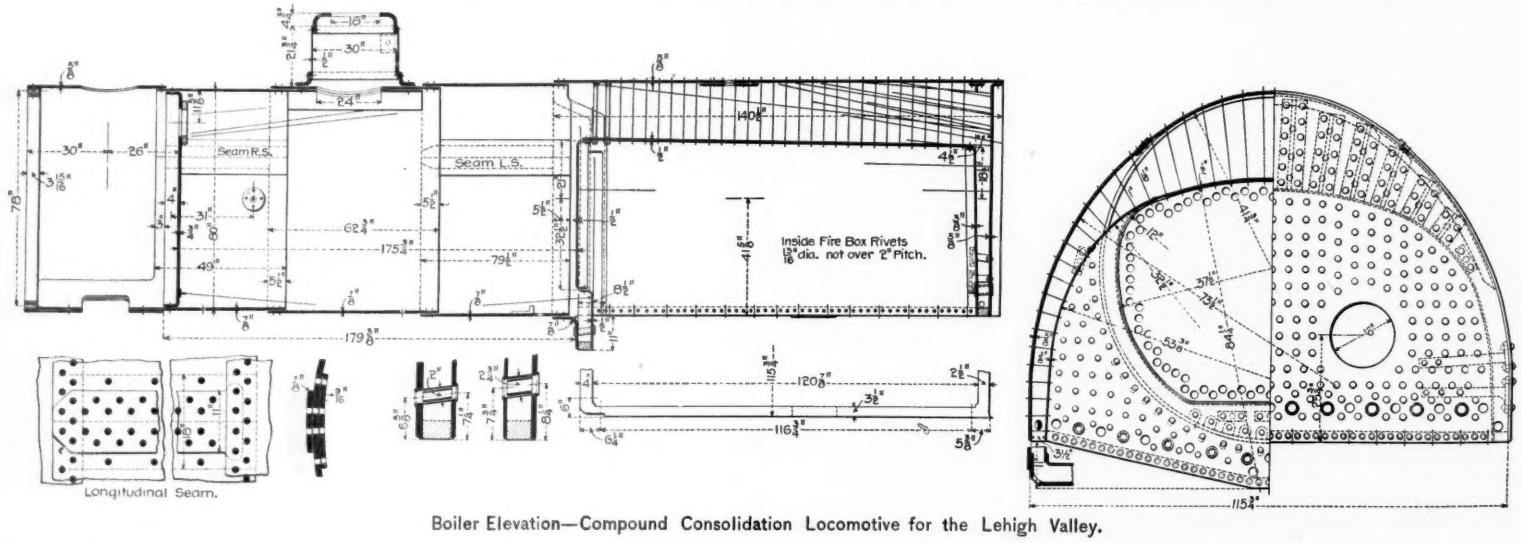
| Name of road.... | Lehigh Valley | Union RR., Pittsburgh | Great Northern |
|---|---|---|---|
| Name of builder.. | Baldwin | Pittsburgh | Brooks |
| Type ..... | Consolidation | Consolidation | 12-Wheel |
| Fuel ..... | Anthracite | Bituminous | Bituminous |
| Weight on drivers, lbs. ..... | 202,200 | 208,000 | 172,000 |
| Weight on trucks, lbs ..... | 22,900 | 22,000 | 40,750 |
| Weight, total, lbs.. | 225,100 | 230,000 | 212,750 |
| Wheel base, total, ft.—in. ..... | 22—10 | 24—0 | 26—8 |
| Wheel base, rigid, ft.—in. ..... | 15—0 | 15—7 | 15—10 |
| Center of boiler above rails, ft.—in | 8—6 | 9—3⅝ | 9—5 |
| Heating surface, firebox, sq. ft.... | 215 | 205.5 | 235 |
| Heating surface, tubes, sq. ft..... | 3,891 | 3,116.5 | 3,045 |
| Heating surface, total, sq. ft..... | 4,106 | 3,322 | 3,280 |
| Grate area, sq. ft. | 90 | 33.5 | 34 |
| Drivers, diameter, in. ..... | 55 | 54 | 55 |
| Cylinders, diameter, in, ..... | 18 and 30 | 23 and 32 | 21 |
| Cylinders, stroke, in. ..... | 30 | 32 | 34 |
| Valves ..... | Piston | Balanced Slide | Piston |
| Boiler, type ..... | Wide firebox | Straight | Belpaire |
| Boiler, pressure, lbs. per sq. in.... | 200 | 200 | 210 |
| Boiler, outside diameter, first course in. ..... | 80 | 80 | 78 |
| Tubes, number ... | 511 | 355 | 376 |
| " dia., in..... | 2 | 2¼ | 2¼ |
| " length over sheets, ft.—in. .. | 14—7¾ | 15—0 | 13—10⅜ |
| Firebox, length, ft.—in. ..... | 10—0 | 10—0 | 10—4 |
| Firebox, width, ft.—in. ..... | 9—0 | 3—4¼ | 3—4½ |
| Smokebox, length, in ..... | 56 | 68⅝ | 67 |

## Steam Boilers.

At the December meeting of the New England Railroad Club, Mr. F. W. Dean read a paper entitled, "Some Thoughts Concerning the Nature and Performance of Boilers." Below are some extracts from that paper:

Stationary boilers are worked hard when one square foot of grate surface gives out eight or ten h. p., or when one commercial h. p. is obtained from eight or ten square feet of heating surface, or when 25 or 30 lbs. of coal are burnt per square foot of grate area per hour. But it is the commonest occurrence for a locomotive to generate 40 h. p. per square foot of grate, to obtain a h. p. from one to two square feet of heating surface, and to burn from 100 to 200 lbs. of coal per square foot of grate per hour.

One is astonished at the ability of a steel plate to transmit heat so rapidly from fire to water. This leads me to say that if it can do so successfully at the usual rates of locomotive usage, most of the fears of thick plates in stationary boilers are groundless. There is a popular superstition among engineers that one-half inch is the thickest plate that ought to be used in a horizontal externally fired tubular boiler, but scientific investigations and some few experiments show this to be a mere notion. Some years ago the maximum thickness was less than ½ in. Thicker plates will behave well when clean, and do just what thin ones do when dirty. In marine practice ⅝ in. formerly was regarded as the maximum thickness of furnaces. In 1890 a paper was read before the Northeast Coast Institution of Engineers and Shipbuilders (England), by W. Kilvington and Alexander Taylor, maintaining that the furnace plates of marine boilers can safely be made of any desirable thickness, and pointing out that they have had furnaces in use on steamships during the previous eight years of greater thickness than ⅝ in., and that for three or four years furnaces ¾ in. thick carried 160 lbs. of steam, all without signs of




Boiler Elevation—Compound Consolidation Locomotive for the Lehigh Valley.

failure. They also state that they should not hesitate to make them one inch thick if circumstances required it. This is not only shown to be a safe thing from theoretical considerations, inasmuch as the principal resistance to the transfer of heat from fire to water is in entering and leaving the plate and not in passing through it, but the experience of these men shows it to be safe even at sea, where difficulties are greater than on land.

The bearing of this upon locomotive practice is that there is no trouble to be anticipated if locomotive firebox plates are made thicker for high pressures than is now common, if it should be desirable for any reason.

I wish to speak of relative values of firebox and tube surfaces of boilers. The usual idea is that a square foot of firebox surface is worth several times as much as a square foot of tube surface. This is, and has been for many years, stated over and over again. It is based upon the fact that a square foot of firebox surface actually does several times as much work as a square foot of tube surface. I have, for several years, maintained that this is of no consequence in designing a boiler, but I have never seen any true appreciation of this matter until the appearance of a recent book by Mr. Bryan Donkin, of London. He states the cause of the greater evaporation of the firebox and tube surface as follows: "The cause lies in the greater difference in temperature between the fire and cooler water at the one than at the other of these two places." It is apparent, furthermore, that if the firebox has taken away some of the heat of the fire there is less heat for the tubes to take up, and therefore in the very nature of the case they cannot evaporate as much as the firebox surface. Given, however, a boiler with no firebox surface, the tubes will rise to the occasion and do all the work, even if the total heating surface is no more than in the other boiler.

It has been my good fortune to test a vertical boiler having a brick furnace and no firebox metal surface except the lower tube sheet. This boiler had no unusual ratio between grate surface and heating surface, and yet it gave on several tests results that are among the highest on record.

One important and interesting thing about boilers is their flexibility in evaporating capacity. I have tested the same boiler at two capacities, one double the other, and obtained precisely the same results. I have made tests of a boiler that apparently proved that easy working produces the most economical results. On other occasions hard working seems to give the most economical results, and it is a fact that the best results that I have obtained from the common horizontal tubular boiler were from that one that was worked hardest of the many that I have tested. Among the highest evaporations that I have obtained from any boiler were those from the boiler of a compound locomotive when burning an average of 70 pounds of coal per square foot of grate per hour, in pulling a fast freight train. The soft exhaust was sufficient to burn the coal, but not strong enough to pull anything but very fine powder into the smoke box.

The question sometimes arises as to the proper size of a locomotive firebox. The C., B. & Q. RR. decided a few years ago to have them large enough to consume 100 to 125 lbs. of coal per square foot of grate per hour, and before the Western Railway Club this rate seemed to meet with general approval. It is in line also with the results of locomotive tests that I have made.

With good coal and on trains of ordinary difficulty the usual rate of evaporation is from 5 to 6 lbs. of water per pound of coal, while on stationary boilers it may be said to be about 9 lbs., although, of course, there are frequent cases of 10 lbs. to 11 lbs., not including banking coal in the latter case. Part of the good results in stationary plants is due to heating the feed water. The great possibility of heating the feed water by the exhaust steam from the locomotive frequently occurs to engineers, and although it is not received with much patience, it ought to be studied out to success. It takes only about one-sixth of the steam from the exhaust to raise the temperature of the feed water from 50° to 200°, and this would save about 15 per cent. of the fuel. As the locomotives in this country use about one-third of the coal mined, or over 50,000,000 of tons per year, this means an enormous saving in money. I am glad to see that one of the railroad clubs has been discussing the best use of the exhaust of the air pump. This might be used for heating the feed. If the feed can be heated it will necessitate the use of pumps instead of injectors, and moreover, pumps driven by the main engine instead of steam pumps, for the use of the latter gives more exhaust to deal with.

## Data as to the Value of Western Coal.

The Government during the past year has tested 36 samples of coal from mines in various parts of this country and Europe to determine their relative heating valves, the results forming a basis both for the purchase of coal and for its distribution. In supplying fuel to the army the standard unit made use of is the cord of standard oak wood. In the following table containing the principal results of these tests, the quantities given therefore indicate the number of pounds of each coal required to equal in heating value one cord of standard oak wood:

| | |
|---|---|
| Huntington, Ark. (Lump) | 1,739 |
| Huntington, Ark. (Mine Run) | 1,765 |
| Delaware & Lackawanna (Anthracite) | 1,841 |
| Kansas | 2,165 |
| Alabama | 2,188 |
| Tennessee | 2,219 |
| British Columbia | 2,222 |
| Colorado | 2,229 |
| Leavenworth, Kan. | 2,307 |
| Cañon City, Colo. | 2,323 |
| Rock Springs, Wyo. | 2,491 |
| New South Wales | 2,593 |
| Utah | 2,639 |
| New Mexico | 2,652 |
| Illinois | 2,660 |
| Indiana | 2,698 |
| Montana | 2,722 |
| Scotland | 3,024 |
| Washington | 3,267 |
| Wyoming | 3,454 |
| North Wales | 3,487 |

The Kansas and Arkansas coals were taken from the mines of the Kansas & Texas Coal Co., and it will be noted that they rank quite high in heating value. As giving further information on this subject, Mr. George B. Leighton, the Vice-President, has furnished the analyses of a number of coals mined by that company, from which the following table has been compiled, and from which a general idea can be obtained of the quality of the coal used by the principal railroads of the Southwest:

Coal Analyses.

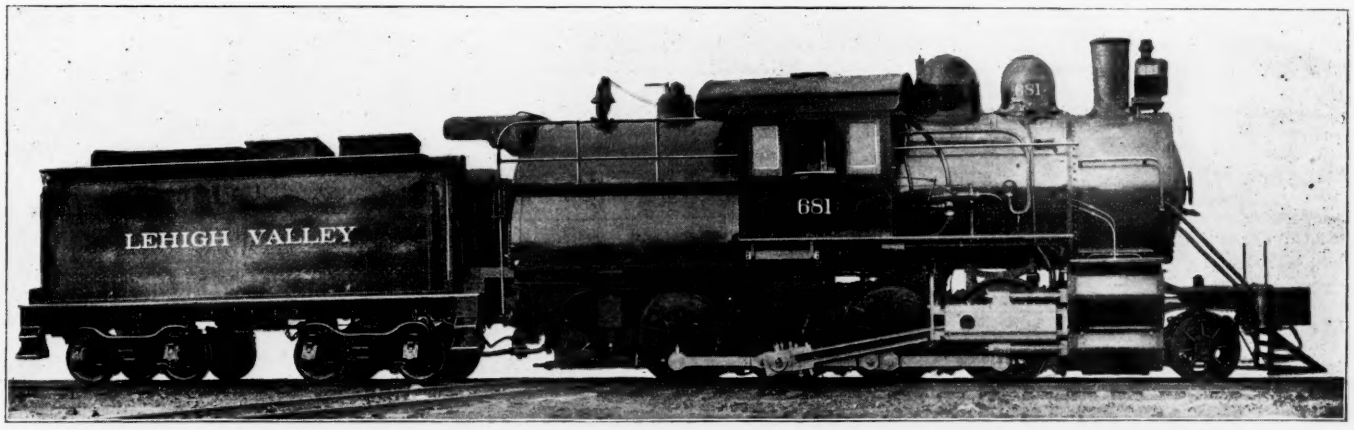
| Mine. | Water. | Volatile Matter. | Fixed Carbon. | Ash. | Sulphur. |
|---|---|---|---|---|---|
| Missouri— | | | | | |
| Marceline | 11.00 | 33.42 | 48.65 | 6.93 | 3.98 |
| Ardmore, Mine 33 | 3.69 | 41.24 | 51.31 | 3.76 | 1.14 |
| Bevier, Mine 43 | 4.39 | 36.66 | 52.50 | 6.45 | 1.80 |
| Kansas— | | | | | |
| Pittsburgh | 1.04 | 36.75 | 57.80 | 4.41 | .... |
| Pittsburgh, No. 3 | 2.30 | 34.97 | 53.08 | 9.65 | 4.97 |
| Pittsburgh, No. 4 | 1.06 | 34.27 | 54.63 | 10.04 | 5.20 |
| Litchfield No. 2 | 2.25 | 33.97 | 49.23 | 14.55 | 7.17 |
| Litchfield No. 5 | 1.29 | 35.72 | 53.97 | 9.02 | 5.00 |
| Leavenworth | 6.70 | 33.18 | 52.74 | 7.38 | 3.09 |
| Weir | 8.91 | 25.14 | 53.38 | 12.57 | 1.76 |
| Weir Slack Coal, washed | 3.58 | 31.87 | 54.45 | 10.10 | 4.16 |
| Weir coke, from slack coal washed | 1.56 | 2.44 | 61.02 | 34.98 | 3.66 |
| Arkansas— | | | | | |
| Huntington | 1.99 | 17.27 | 72.87 | 5.18 | 2.69 |
| Huntington washed slack | 1.45 | 14.78 | 75.71 | 7.22 | .84 |
| Huntington coke | 2.14 | 2.17 | 77.21 | 17.31 | 1.17 |
| Indian Territory— | | | | | |
| McAlester No. 1 | 2.50 | 34.61 | 55.88 | 7.01 | .60 |
| McAlester No. 2 | 4.00 | 34.00 | 53.00 | 7.50 | 1.50 |
| Poteau | .48 | 20.86 | 66.14 | 12.52 | .... |
| Folsom | 1.19 | 24.41 | 64.46 | 8.46 | 1.48 |
| Bryan | 1.12 | 22.85 | 70.48 | 5.56 | .89 |
| Cavinal | 1.26 | 22.27 | 65.51 | 1.96 | 4.04 |
| Braidwood | .13 | 24.50 | 71.82 | 3.55 | 1.37 |
| Locke & Adams 24-ft. vein | 5.10 | 44.30 | 46.11 | 3.02 | 1.47 |

Evaporative tests made by the St. Louis Sampling & Testing Works, with a 54-in. diameter return tubular stationary boiler, furnish data for an interesting comparison between the well-known Pocahontas lump coal of West Virginia and Arkansas coal from the Jenny Lind mine of the Western Coal & Mining Co. The latter coal is practically the same as the Huntington coal mentioned above, the mines being located but a short distance apart. The principal results of these tests are given below, and would seem to show that certain kinds of western coal are well fitted for use with locomotive and stationary boilers. A very complete report as to the value and character of Arkansas coal was made several years ago by Mr. Arthur Winslow and is to be found in Vol. 3 of the Arkansas Geological Survey of 1888:

Arkansas Coals Compared with Pocahontas Lump Coal.

| | Pocahontas, (W. Va.) Lump. | Jenny Lind, Ark. |
|---|---|---|
| Duration of test, hours | 8.00 | 9.00 |
| Mean steam pressure above temperature, by gage, lbs. | 75.30 | 75.70 |
| Mean temperature of feed water, deg. F. | 80.40 | 80.80 |
| Pounds of water apparently evaporated, lbs. | 18,576.00 | 20,021.00 |
| Equivalent evaporation to dry steam from and at 212° F., lbs. | 21,767.00 | 23,453.00 |
| Equivalent evaporation per hour, lbs. | 2,721.00 | 2,606.00 |
| Equivalent evaporation, boiler h. p. | 78.80 | 75.50 |
| Equivalent evaporation per hour per square foot of heating surface, lbs. | .373 | .357 |
| Weight of coal used, plus coal equivalent of wood, lbs. | 2,063.00 | 2,359.00 |
| Weight of ashes, clinkers and coal which fell through grate, lbs. | 48.00 | 67.00 |
| Percentage of waste, per cent. | 2.33 | 2.84 |
| Weight of unburned fuel which fell through grate, lbs. | 16.00 | 22.50 |
| Percentage of unburned fuel which fell through grate, per cent. | .77 | .94 |
| Weight of clinkers in fuel, lbs. | ..... | 24.00 |
| Percentage of clinkers in fuel, per cent. | None. | 1.02 |
| Mean pressure of draft in fuel, inches of water | .30 | .234 |
| Mean thickness of fire, inches | 6.00 | 6.00 |
| Pounds of coal burned per hour per square foot of grate, lbs. | 17.20 | 17.50 |
| Pounds of coal burned per hour per square foot of heating surface, lbs. | .35 | .36 |
| Mean smoke production, on scale of 10 | Trace. | Trace. |
| Evaporation of water from and at 212° F., per pound of coal | 10.55 | 9.94 |
| Fuel used, kind | Lump. | Lump. |
| Chemical composition of coal, ultimate: | | |
| Carbon, per cent. | 85.22 | 82.68 |
| Hydrogen, per cent. | 4.31 | 4.65 |
| Oxygen and nitrogen, per cent. | 5.79 | 3.98 |
| Sulphur, per cent. | .68 | 1.57 |
| Chemical composition of coal, proximate: | | |
| Water, per cent. | 1.68 | .94 |
| Volatile, per cent. | 17.45 | 13.64 |
| Fixed carbon, per cent. | 75.99 | 76.73 |
| Ash, per cent. | 4.20 | 7.12 |
| Calorific power of coal, B. T. U., per lb., calculated | 14,760.00 | 14,744.00 |
| Theoretical evaporative power from and at 212° F. | 15.29 | 15.27 |
| Percentage of total calorific power utilized, or efficiency, per cent. | 69.00 | 65.10 |
| Percentage of capacity developed of boiler rating, per cent. | 129.60 | 124.17 |

Description of Boiler.—One Return Tubular Steel Boiler, 54-inch diameter, 16 feet long, with 36 4-inch flues. Heating surface: On shell, 166 square feet; of tubes, 564 square feet; total, 730 square feet. Plain setting, with "standard" rocking grates 3 feet by 5 feet, giving 15 square feet of grate surface. Percentage of opening, 27½. Area of chimney's cross section, 4.25 square feet; height of stack, 72½ feet.




Heavy Vauclain Compound Consolidation Locomotive for the Lehigh Valley Railroad.

## A New Car Roof.

Mr. W. D. Drake, of the Drake & Weirs Co., Cleveland, O., has lately taken out patents covering certain improvements in double car roofs, or those having an outer covering of boards and an inner covering of sheet metal, the object being to provide a water-tight flexible inner roof, which will not be affected by strains in the upper car framing. Fig. 1

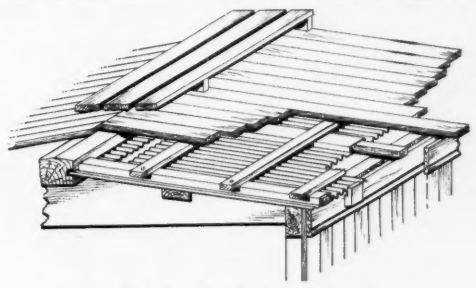


Fig. 1.—The Drake Car Roof.

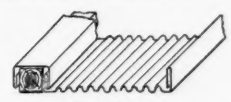


Fig. 2.

Fig. 3.

is a view of this roof, having a part removed to show the construction of the inner covering. Fig. 2 is a section of the inner roof, and Fig. 3 a similar view

showing a modified form of the metal cap or hanger which holds the metallic sheets.

It will be seen that metal caps or hangers are used which fit around the rafters and extend from the eaves of the car to the ridge pole. The sides of the caps are formed as shown in Figs. 2 and 3, so that the sheets slide into and interlock with the hangers, making a continuous flexible covering. The sheets are kept in place by stop blocks fastened to the sides of the car beneath the facia-boards. In making repairs it is only necessary to take off the facia-boards and stop blocks, and slide out the sheets. These metallic sheets can be made either corrugated or plain, but the corrugated sheets are preferred. The outer board covering is the same as is now commonly used.

### Cupped Fire Box Sheets.

Mr. R. J. O'Neill, Foreman of the Chicago & Alton boiler shop, at Bloomington, Ill., has for some time past been experimenting to overcome the increased troubles with leaky and broken stay bolts and cracked fire-box sheets incident to high steam pressures, and his conclusions point to the cupped fire-box sheet as the remedy. While the plates forming the outer shell and the cylindrical parts of the boiler can readily be increased in thickness to correspond with increases in steam pressure, it has been found desirable to make the fire-box sheets as thin as possible and support these sheets by stay bolts; increases in steam pressure therefore require either an increase in the strength of the inside sheets or a closer spacing of the stay bolts, introducing more places for the starting of cracks and leaks.

Fig. 1.

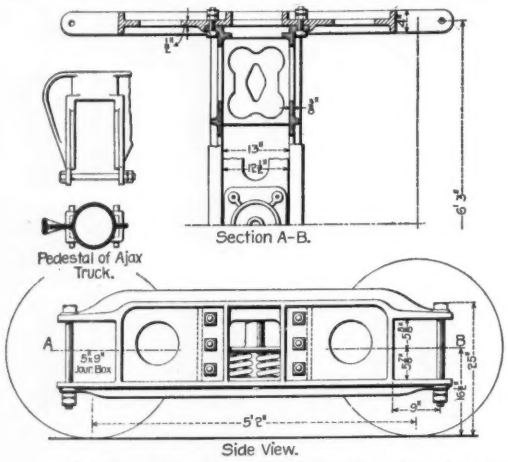
Fig. 2.

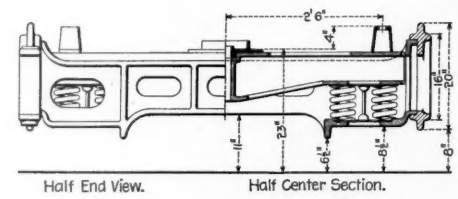
Fig. 3,

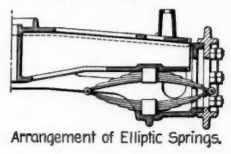
The plan proposed is to retain the thin fire-box sheets, but to put the portions of the sheets between the bolts into a stronger form by means of depressions or cups. The idea is illustrated by the accompanying engravings. Thus, Fig. 1 shows the inside and outside walls of a fire-box boiler in their normal positions; Fig. 2 shows the way in which the inner sheet is found to bulge outward toward the fire between the stay bolts, resulting in the inside of the sheet being forced away from the stay bolts. Figs. 3 and 4 show the form of the cupping introduced by Mr. O'Neill, while Fig. 5 gives the shape of the dies used for forming the sheets in an ordinary power punching machine.

Mr. O'Neill writes in reply to our inquiry that with the present practice of staying boilers, the sheet between the stay bolts is found to bulge outward toward the fire, as shown in Fig. 2, and in so doing the sheet is pulled away from around the inside of the stay bolt, leaving the hole tapered, causing a leak, and in many cases cracking the sheet. This bulging has been overcome by making the inner sheet with the curved depressions or cups, as shown in Fig. 3. This method is said to keep the stay bolts tight and to preserve the sheets from cracking. It has also been shown by a test that by making use of these depressed fire-box sheets the ultimate tensile strength of the material used can be reduced from 60,000 to 70,000 lbs. per sq. in. to from 44,000 to 50,000 lbs. per sq. in., the stronger form of the sheets making up for the difference in the strength of the material. This is stated to be of importance, in view of the fact that the greater tensile strength of steel boiler plates is obtained largely by increasing the carbon, with the result that the high carbon steel is apt to be brittle and cause trouble from cracking. It is held also that punching injures all steel plates more or less, and the harder the material the more it is affected by such working, so that on this account soft steel is to be preferred to hard for fire-boxes. The depressions are made circular in form and are but the thickness of the plate in depth, so that the chance for sediment adhering to the cupped plates is no greater than with the usual straight sheet; the change of shape of the plates is so slight that they are not injured in the forming. In view of the experience with these cupped fire-boxes, Mr. O'Neill recommends that all steel fire-box plates be depressed, then annealed, and finally drilled for the stay bolts.

It may be added that the method described differs from the cupped fire-box sheets used largely by the Chicago, Rock Island & Pacific, in that the latter road makes the circular depressions into the water space concentric with the stay bolts, while Mr. O'Neill's method is to make the depressions between the stay bolts.



Arrangement of Elliptic Springs.

Details of the Low, 80,000 lbs. Capacity, Cast Steel Truck—Shickle, Harrison & Howard Iron Co

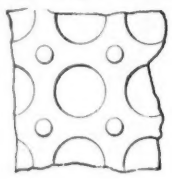


Fig. 4.

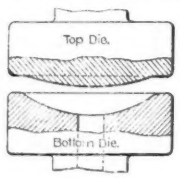



Fig. 5.

### The Most Desirable Metal for Driving Boxes.*

Experience shows that with the modern heavy type of locomotive coming into service a stronger metal than cast iron is desirable for driving boxes in order to obtain the required strength without increase in size and weight. Steel, and what is known as steeled iron, or cast iron with the addition of boiler steel, malleable iron and solid brass or bronze, are now used. Each of these have their advantages and disadvantages. Steel, while superior in strength, requires face or hub liners of different metal to prevent cutting, and is also more expensive to machine in fitting up, and requires more care in the setting up or adjusting wedges to prevent cutting. Solid boxes of brass or bronze are heavy and very expensive; also the waste of metal in boring out the crown to maintain the axle fit in case of wear, instead of closing the brass, as can be done with the iron or steel box and shell bearing, is a disadvantage.

While the committee has no experience with malleable iron boxes, Mr. J. A. Graham, Master Mechanic of the Cleveland, Lorain & Wheeling, reports that they have been using malleable iron driving boxes with very good results for the past two and one-half years, and during that time have not had a broken or cracked box, and have been able to reduce the weight over that of the cast iron 40 lbs. The hub faces wear slightly faster than cast iron, but run well with either brass or copper liners. Mr. Graham adds that, from his experience, he would recommend malleable iron, they having used the steel and cast iron boxes.

Mr. W. Lavery, Assistant Superintendent of Motive Power of the Chicago & Erie, reports that, from his experience with modern heavy locomotives, good cast steel driving boxes and special bronze bearings used sectionally are what we must come to, adding that steel boxes and steel wheels will not work satisfactorily together; therefore, hub liners of bronze must be provided. They have tested loose hub liners and find them satisfactory.

The Baldwin Locomotive Works reports that its practice is to make driving boxes of cast iron to which is added about 10 per cent. of steel; in other words, steeled cast iron. Where it is necessary to get a light box and at the same time a strong one, open hearth cast steel is used in place of cast iron. Very few solid bronze driving boxes are made, and it does not approve of the practice. It has been found that the solid brass boxes in a great many cases are unsatisfactory, and at the same time very expensive. Ordinary cast iron is too soft, and steeled cast iron is very durable, except where the design is light, in which case cast steel should be substituted, and in all cases the brasses should be in the shape of the shell bearing.

The chairman of the committee reports that 10 locomotives of the 10-wheel type were built from the same specifications and did the same work, five of them having cast iron driving boxes and five steeled iron driving boxes. In 34 months' service six of the steeled boxes were broken, as compared with 26 of the cast iron boxes broken in the same time. The steeled iron boxes referred to were made by the Schenectady Locomotive Works, and are reported to have had 25 per cent. of boiler steel, the same being clippings and punchings from boiler plate. The Schenectady Locomotive Works reports that it is in favor of steel boxes, although they add to the cost of the engine. When steel boxes are used the face of the box or the hub of the wheel must be faced with some other metal, such as cast iron, brass or babbitt. Its practice is to use almost altogether the solid or shell brass, which seems to give the best general results.

The committee, from its experience and the data obtained, recommends steeled iron where the size and weight will admit; steel where the box is of light pattern and of the strength required, and in all cases recommends the sectional bearing of circular pattern as the most satisfactory and economical.

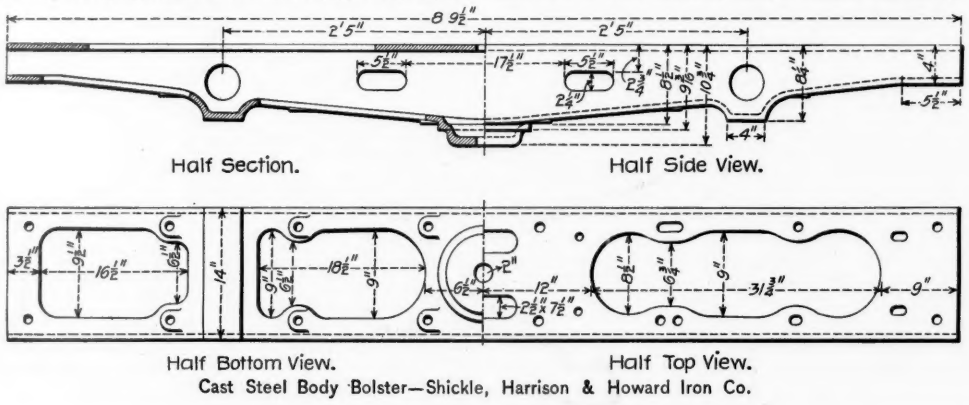
*Extracts from a report to the Central Railway Club by Messrs. E. A. Miller A. M. Waitt and J Hawthorn, November. 1893.

### A Low Cast Steel Truck.

The wide difference of opinion among mechanical men as to the relative merits of the solid frame and the arch bar type of freight truck is prompting the large makers to put themselves in such a position that they can furnish trucks of either type, as the railroads may desire. The Shickle, Harrison & Howard Iron Co., of St. Louis, last year brought out two cast steel trucks, the Ajax and Player, the Ajax being a rigid truck consisting of but three castings, a transom and two solid side frames, with the springs located directly above the journal boxes. The Player truck has a cast steel transom, the ordinary arch bars, and a cast steel bolster, the springs being placed beneath the ends of the truck bolster. Both of these trucks, which were illustrated in our issue of July 30, 1897, have been largely used, and have given satisfactory results in service. However, to meet the demands of some roads for a low truck with solid side frames, a new design has been made, shown by the accompanying engravings, which embodies some of the essential features of both the Ajax and Player trucks and permits of almost any spring arrangement desired.

It might be well to state that so far low trucks have been used principally with furniture cars, but a few roads have already recognized the importance of making the truck quite low for all classes of cars, so as to leave as much room as possible for the body bolster. An objection which has been raised to low trucks of the diamond frame type is that by decreasing the depth of the truss the frames are weakened, but it is apparent that this difficulty may be readily overcome by the use of cast steel.

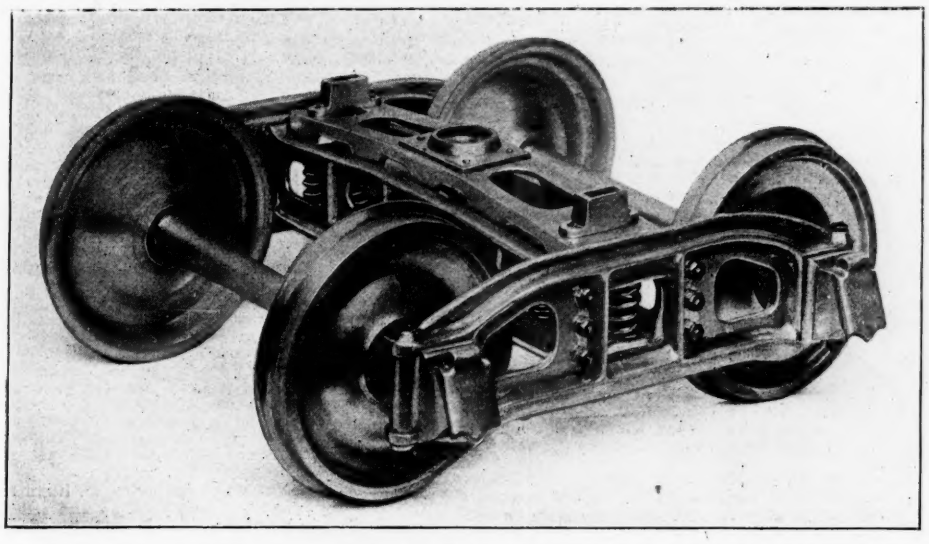
Referring to the engravings showing the new design of the Shickle, Harrison & Howard Co. for 80,000-lbs. capacity cars, it will be seen that the transom and truck bolster are the same as have heretofore been used with the Player truck, and that the transom rests upon projecting brackets cast on the side frames, the members of the frame being bolted together. The distance from the top




Cast Steel Body Bolster—Shickle, Harrison & Howard Iron Co.

of the rail to the bottom of the lower center plate is but 23 in., making probably as low a truck as has been used; in cars recently built this distance has generally been made as great as 30 in., and in a few instances even greater. It will be noted that the wheels can be removed by taking out the end pedestal bolts, and that in the design shown the springs, either coil or elliptic, are placed under the ends of the truck bolster. A modification of this design makes use of the pedestal of the Ajax truck, where coil springs are placed in recesses in the frame directly above the journal boxes, in addition to the springs under the bolster. This spring arrangement is intended for cars where increased spring action is needed, such as meat cars, where the load is suspended from the roof. The use of cast steel makes possible the use of a small number of parts and simple connections.

The weight of the frames, transom and bolster for



Low, 80,000 lbs. Capacity, Cast Steel Truck—Shickle, Harrison & Howard Iron Co., St. Louis, Mo.

the truck shown is approximately 1,500 lbs., and the metal used shows an ultimate tensile strength of about 60,000 lbs. per sq. in., and an elongation of from 15 to 20 per cent in an 8-in. specimen. The results of chemical analyses of the steel used are quite uniform, and are as follows: Carbon, 0.25 per cent.; silicon, 0.25 per cent; phosphorus, 0.02 per cent., and sulphur, 0.035 per cent.

## Precise Leveling in Boston.

By John N. McClintock.

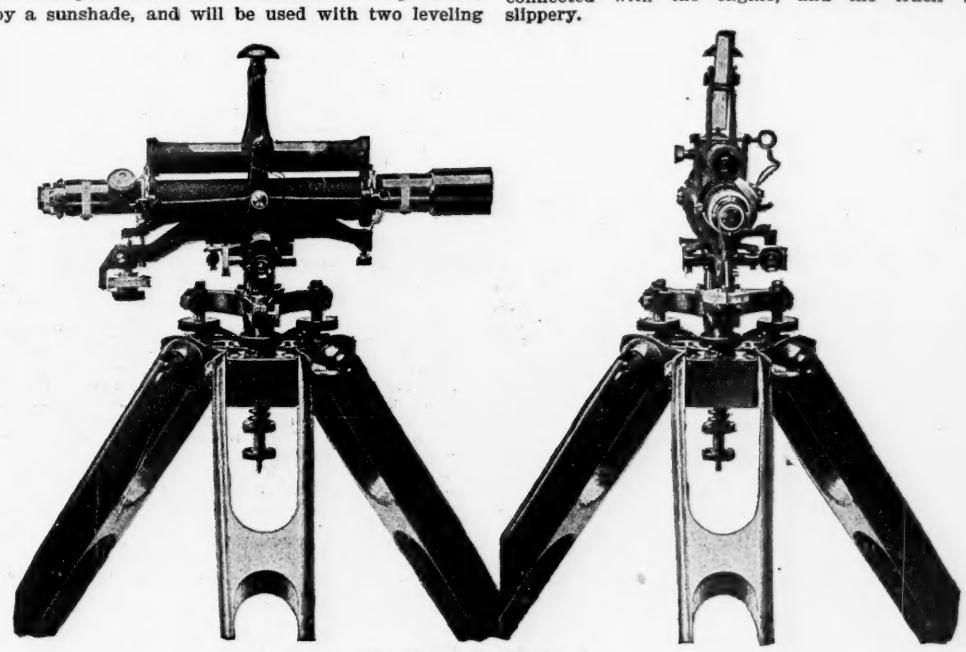
As the standard survey of Boston, commenced by the Board of Survey in 1891, and carried on by the Board of Street Commissioners, approaches completion under the direction of the Chief Engineer, John W. Morrison, the establishment of permanent bench-marks throughout the city by lines of precise leveling has been undertaken.

The first effort made by the city in this direction was started in 1858 by Charles Harris, who established a line of benches extending from the Coast Survey bench-mark at the Charlestown Navy Yard to Chestnut Hill Reservoir. Since 1878 various lines have been run by Franklin M. Miner, who for many years has had charge of the establishment of street grades. The present work is being done by a party directed by E. H. Rogers.

The need of this work is not on account of bad work in the past, but becomes necessary not only because the city has from time to time absorbed outlying districts, each with an independent system of benches (in one or more cases referred to a different base), but because in the course of time with the building and development of the city old landmarks have disappeared. The necessity of the work being recognized, to make it conform to the high standard attained in the balance of the work of this great survey, it was decided that the leveling must be done as perfectly as modern skill permits.

The instrument with which this work is being done is one made at the suggestion and with the advice of Dr. T. C. Mendenhall, President of the Worcester Polytechnic Institute, by Mr. C. L. Berger, of the firm of C. L. Berger & Sons of Boston, who recently succeeded to the business of the old firm of Buff & Berger. The instrument is a fine example of the best that has been produced in this country or abroad. The tripod head is of metal, so designed as to obtain the greatest rigidity with the least weight, and supported by legs as firm as if made for a massive theodolite. The vertical center upon which the instrument revolves differs from that ordinarily used in being made of hardened steel, very long and unyielding, to afford greater steadiness with the least friction, and runs in a cast-iron socket fitted to a degree of perfection which only the most advanced modern machinery permits of. The cross-bar is cast hollow and is very rigid. The whole movement carries two plate levels and rests on three widely spread leveling screws. The cradle which supports the telescope by agate contact in the Ys rests on a horizontal axis which is at the same height as the optical axis of the telescope, has a vertical motion of several degrees, and is adjusted for level by a micrometer screw at end of the cross bar. The telescope is of brass, bound with steel collars where it comes in contact with the agate supports in the Ys of the cradle, and is so constructed that, were it cut into two parts, each part would balance in the supporting Y. The magnifying power of the 18-inch telescope is about 40 diameters, with one vertical and three horizontal stadia wires, and has, to obtain better light, an aperture of 1⅝ inch, although the hardened steel collars are about 1⅛ inch in diameter. The adjustable striding level has a value of 4.3 seconds of arc for each $\frac{1}{10}$ inch division into which it is divided, and may be securely attached in place. The level tube is protected by an enclosing glass cover, and may be read without displacing the observer from his position before the eye piece of the telescope by a suspended mirror resting upon an aluminum support which serves as a handle. The focusing slide is nearly the whole length of the telescope. By a clamp screw opposite the micrometer screw the cradle can be secured so that the instrument can be used for ordinary Y level work.

As a whole, the instrument has a plain cloth finish and is constructed so as to minimize the effect of the expansion and contraction of the metals. Every part which comes in contact with the observer's hands is protected by a non-heat-conducting substance. For its most perfect work in the field it will be protected by a sunshade, and will be used with two leveling



The Berger Precise Level.

rods designed by Mr. C. H. Van Orden and made by Messrs. Gurley, of Troy, N. Y.

## Train Accidents in the United States in November.

### COLLISIONS.

#### Rear.

1st, on Philadelphia & Reading, at Boiling Springs, Pa., a freight train descending a grade broke in two and the rear portion afterward ran into the forward one, wrecking three cars. A tramp was killed.

2d, 8 p. m., on Union Pacific, near Florena, Kan., a freight train broke in two and the rear portion afterward ran into the forward one, badly damaging several cars. The conductor and three passengers riding in the caboose were injured.

6th, on Baltimore & Ohio, at Milford Junction, Ind., a freight train taking water was run into at the rear by a following freight, badly damaging several cars. Three passengers riding in the caboose were injured.

6th, on Louisville & Nashville, at Henry, Tenn., a freight train standing at the station was run into at the rear by a following freight and the caboose was badly damaged. Three trainmen in the caboose were injured.

8th, on New York, New Haven & Hartford, near Willis avenue, New York City, a freight train standing in the yard was run into at the rear by a following local freight train, which approached at uncontrollable speed. The caboose and several cars were badly damaged and the wreck took fire from the stove in the caboose. One trainman was injured.

9th, on Wabash road, near Rich Valley, Ind., a freight train which had been delayed in consequence of the inability of the engine to pull it up a grade was run into at the rear by a following empty passenger engine, and the engine, caboose and two cars were wrecked. The engineman and fireman were injured.

10th, on Union Pacific, at Laramie, Wyo., a passenger train ran into a switching engine in the yard, badly damaging both engines. There was a dense fog at the time. A fireman was injured.

14th, on Southern Railway, at Bryan, Ala., a freight train ran into the rear of a preceding freight, wrecking the caboose. One passenger was injured.

15th, 11 p. m., on Missouri Pacific, near Avery, Neb., a freight train descending a grade broke in two and the rear portion afterward ran into the forward one, wrecking three cars. A brakeman and a tramp were injured, the latter fatally.

18th, on Pennsylvania road, at Florence, N. J., passenger train No. 318, standing at the station, was run into at the rear by passenger train No. 328, and the rear car of the foremost train was wrecked. The stove in this car was upset and the car and the station building were burned up. The few passengers had warning and escaped from the car before the engine struck it. The colliding engine was badly damaged. The conductor of the foremost train and the engineman of No. 328 were injured. It is said that the flagman of the foremost train did not go far enough back.

18th, on Philadelphia & Reading, near Merion, Pa., a passenger train ran into the rear of a preceding freight and the engine was overturned. The fireman jumped off and was injured. Several freight cars were wrecked and partially destroyed by fire. There was a dense fog at the time.

19th, on Cincinnati, New Orleans & Texas Pacific, near McLean avenue, Cincinnati, a freight train ascending a steep grade broke in two and five cars ran back into the head of a following engine. Several cars were wrecked and two of them fell off a trestle into the street below. One of the cars contained oil, which took fire, and a part of the wreck was burned up. A man walking beneath the trestle was badly injured.

20th, on Cincinnati, Hamilton & Dayton, near Toledo, O., a passenger train ran over a misplaced switch and into a car standing on a side track, badly damaging several cars. Two trainmen were injured.

23d, on Wisconsin Central, at St. Paul, Minn., a freight train ran into the rear of a preceding work train, wrecking four cars and badly damaging a bridge. The engineman jumped off and was injured.

26th, on Lehigh Valley, at East Waverly, N. Y., the rear portion of a freight train which had broken in two, and which was left standing in the yard, was run into at the rear by a following freight, drawn by two engines, which approached at uncontrollable speed. It is said that the runner of the second of the two engines had control of the air brakes. The train consisted of 45 cars, but only 14 of them had brakes connected with the engine, and the track was slippery.

26th, on Burlington & Missouri River, at Broken Bow, Neb., a passenger train standing at the station was run into at the rear by a following freight, damaging the engine, one sleeping car and several freight cars. A brakeman was injured.

26th, on Pennsylvania road, at Manayunk, Pa., a freight train standing at the station was run into at the rear by a following freight, and several cars were wrecked. One trainman was injured. The engine and several cars fell from the bridge on which they were standing and lodged on the track of the Philadelphia & Reading below. The caboose took fire and was burned up.

28th, 2 a. m., near Clinton, O., a freight train of the Cleveland, Akron & Columbus ran into the rear of a freight of the Baltimore & Ohio, which was standing at a tank. The engine and eight cars were wrecked. There was a dense fog at the time. Two brakemen were injured.

29th, on Burlington, Cedar Rapids & Northern, near Grundy Center, Ia., a freight train ascending a grade broke in two and the rear portion ran back into the head of a following passenger train. The conductor and baggageman of the passenger train were injured.

29th, on Atchison, Topeka & Santa Fe, near Clifton, Tex., a freight train, which had been stopped by track repairers, was run into at the rear by a following freight and the caboose was wrecked.

A moment later a third freight ran into the rear of the second, wrecking the caboose. Two brakemen were injured.

And 30 others on 26 roads, involving 7 passenger and 47 freight and other trains.

Butting.

1st, on Cumberland Valley, near Newville, Pa., butting collision of freight trains, wrecking one engine and badly damaging nine cars. The wreck took fire and, with a large tank of oil standing near the track, was burned up.

4th, on Cleveland & Marietta, near Canal Dover, O., butting collision of a freight train and an empty engine, wrecking both engines and four cars. Two brakemen were injured.

11th, 3 a. m., on Lehigh Valley, near Newport, Pa., butting collision between westbound passenger train No. 5 and eastbound pasenger train No. 6, the latter drawn by two engines. No. 5 was on a steep descending grade and ran some distance past a side track, where it should have waited for No. 6. All three engines and two express cars were badly damaged. Four trainmen and one express messenger were killed and five other trainmen were injured, one of them fatally. The rails were wet and there were many leaves on the track.

17th, on Kansas City, Pittsburg & Gulf, near Janssen, Ark., butting collision between freight trains, one of which was drawn by two engines, wrecking two cars and badly damaging the engines. Several trainmen were injured, one of them fatally.

17th, on Pennsylvania road, near Helmetta, N. J., a freight train ran over a misplaced switch and into the head of another freight, damaging both engines. One engineman and one fireman were injured.

18th, on Chicago, Rock Island & Pacific, at Moscow, Ia., butting collision of freight trains, making a bad wreck. Five trainmen were injured, one of them fatally.

A wrecking train, which was soon after started from Wilton for Moscow, was run into by a fast mail train, and one of its cars, containing about 20 men, was badly damaged. The conductor and five other employees on the wrecking train and the fireman of the mail train were injured. It is said that a stop signal was displayed at Wilton for the mail train, but was not observed.

23d, on St. Louis, Iron Mountain & Southern, near Homan, Ark., butting collision of freight trains, running at full speed, wrecking both engines and eight cars. One engineman and one fireman were injured.

27th, on Northern Pacific, near Bonita, Mont., butting collision betweeen an empty engine, westbound, and a freight train, eastbound, both running at full speed. Both engines and several cars were wrecked. The boiler of one of the engines exploded. One fireman was killed and both enginemen were injured.

And 16 others on 15 roads, involving 1 passenger train and 31 freight and other trains.

Crossing and Miscellaneous.

1st, on Cleveland & Marietta, at Newcomerstown, O., collision between a freight train and a work train, badly damaging both engines. Four employees were injured.

2d, on Cumberland Valley, at Newville, Pa., collision between a freight train and a wrecking train, badly damaging one engine and five cars. One trainman was badly scalded. It is said that the collision was due to a misplaced switch.

3d, on Southern Pacific, at Stockton, Cal., collision between a passenger train and a freight; one brakeman injured.

4th, on Norfolk & Western, near East Radford, Va., collision between a freight train and an empty engine, badly damaging both engines. A brakeman was killed and one engineman injured. There was a dense fog at the time.

5th, on Erie road, at Galion, O., collision between a freight train and a switching engine, on which were several shopmen riding to dinner. One of these employees was killed and four were injured.

5th, 9 p. m., near Council Bluffs, Ia., collision between a passenger train of the Omaha & St. Louis and a freight of the Union Pacific. The Union Pacific fireman was killed and two other trainmen were injured. The freight train had the right of track, but the passenger train approached at uncontrollable speed. It is said that the air brakes on the passenger train had not been coupled and tested.

9th, on New York Central & Hudson River, at Grand Central Station, New York City, the cars of a passenger train approaching the station, which had been detached from the engine with a view to running them into the train shed, were thrown upon a track on which a switching engine was standing and collided with the switcher. Five passengers and three trainmen were slightly injured.

11th, on Atchison, Topeka & Santa Fe, at Paxton, Kan., a freight train entering a side track was run into by a freight from the opposite direction and one engine and several cars were ditched. Three trainmen were injured.

13th, on Philadelphia, Wilmington & Baltimore, at Franconia, Va., a southbound freight train ascending a grade became stalled and a part of the cars were taken to Franconia and backed into the side track. While this was being done a northbound freight train, which had been waiting on the side track some time, was started out and ran into the rear portion of the southbound train which had been left standing on the main track. Several cars were wrecked. One of them, which contained oil, took fire, and, with the other two, was burned up.

16th, on Lake Shore & Michigan Southern, near Toledo, O., collision of freight trains in the yard; one brakeman badly injured.

18th, on Denver & Rio Grande, at Edgerton, Col., passenger train No. 11 collided with a freight engine standing on a side track, but not clear of the main line, making a bad wreck; engineman and fireman badly injured.

18th, on Denver & Rio Grande, near Colorado Springs, Col., collision between a passenger train and a freight; two employees injured.

21st, on New York Central & Hudson River, at Sackett's Harbor, N. Y., a passenger train approaching the station at uncontrollable speed ran beyond the platform and collided with some freight cars. One passenger was injured.

23d, on Western New York & Pennsylvania, in the yard at Oil City, Pa., a special train carrying officers of the road, moving backward, collided with a freight train. It is said that the freight depended on a whistle signal for notice of the approach of the special, but that the signal was omitted because the city had recently passed an ordinance prohibiting the sounding of locomotive whistles within the city limits.

23d, 9 p. m., on New York, New Haven & Hartford, at Waterbury, Conn., collision between a freight train and a switching engine; one employee was killed and three injured, one fatally.

25th, 3 a. m., at Milano, Tex., a freight train of the Atchison, Topeka & Santa Fe ran into a passenger train of the International & Great Northern at the crossing of the two roads, damaging the baggage car and one passenger car. Several passengers and two postal clerks were injured. The postal car fell down a bank.

26th, on Delaware, Lackawanna & Western, near Utica, N. Y., a car which escaped control while being switched, ran some distance down a steep grade and collided with a locomotive. The fireman on the engine was killed and two other trainmen were injured.

And 19 others on 18 roads, involving 7 passenger and 28 freight and other trains.

## DERAILMENTS.

Defects of Roadway.

27th, on Norfolk & Western, near Riverside, Va., a freight train broke through a bridge which was undergoing reconstruction, and the engine and three cars fell, with one span of the bridge, to the ground, 20 ft. below. The fireman was killed and the engineman and one brakeman were injured.

28th, on Wheeling & Lake Erie, at George's Run, O., a passenger train was derailed by a broken rail and the engine was ditched. The engineman was injured.

And 3 others, involving 3 freight trains.

Defects of Equipment.

7th, 8 p. m., on Erie road, near New Hampton, N. Y., a freight train was derailed by a broken journal and 14 cars were ditched. A brakeman was injured.

10th, on Erie road, at Randall, O., a freight train was derailed by a brake beam which fell upon the track, and 15 cars were wrecked. A brakeman was injured.

11th, 4 a. m., on Lehigh Valley, near East Rush, N. Y., a freight train running at full speed broke in two; both portions were quickly stopped by the air brakes, but several cars were wrecked. Both main tracks were blocked for 10 hours.

14th, on Findlay, Fort Wayne & Western, near Grover Hill, O., a mixed train was derailed by the breaking of a truck of a freight car, and the passenger cars were ditched. Four passengers were injured.

26th, on Pittsburgh, Ft. Wayne & Chicago, near Delphos, O., a train of 100 loaded cars broke in two and a drawbar fell upon the track and derailed five cars.

26th, on New York, New Haven & Hartford, at Georgetown, Conn., an express passenger train was derailed by the breaking of the tire of one of the wheels of the baggage car. The engine broke away from the train and was not derailed. The derailed baggage car, after running some distance, opened a facing point switch and, with the parlor car, ran against some freight cars on a side track and both these cars and two freight cars, were badly wrecked. There were only three passengers in the parlor car and two of these escaped injury. Two trainmen and one passenger were injured, the latter slightly.

And 25 others on 19 roads, involving 3 passenger and 22 freight and other trains.

Negligence in Operating.

7th, on Baltimore & Ohio, at Mt. Vernon, O., a passenger train was derailed at a derailing switch and the engine was overturned. The engineman and another man riding in the cab were injured.

7th, on Chicago & Alton, at Pontiac, Ill., a freight train was derailed at a misplaced switch, and several cars were wrecked. A tramp was injured.

And 8 others on 8 roads, involving 1 passenger train and 8 freight trains.

Unforeseen Obstructions.

18th, on Santa Fe, Prescott & Phoenix, near Prescott, Ariz., a train consisting of an engine and a caboose, the engine pushing, was detrailed and ditched by running over a steer. One employee was killed and three were injured.

20th, 7 p. m., on Cleveland, Cincinnati, Chicago & St. Louis, near Alton, Ill., a passenger train was derailed by running over a cow, and every one of the 12 passengers on the train were injured. The train consisted of an engine and one car, and the cow fell upon the track after the engine had passed. The car struck the Wood River bridge and the top of it was torn off and fell into the river.

27th, on Boston & Maine, at North Berwick, Me., a snowplow was derailed and, with the engine pushing it, fell down a bank. The engineman and fireman were killed.

28th, on Long Island road, near Jamaica, N. Y., a snowplow was derailed and the engine pushing it was ditched. The conductor was killed and two other trainmen were injured.

28th, on New York, New Haven & Hartford, at Cole's, R. I., a work train was derailed in a snowbank; a trackman was killed and three other employees were injured.

28th, on Northern Pacific, near Montesano, Wash., a train consisting of an engine and a caboose, the engine pushing, was derailed by running over a bull which was lying on the track, and the caboose and tender were ditched. A brakeman was injured.

And 6 others on 6 roads, involving 2 passenger and 4 freight trains.

Unexplained.

3d, on Southern Pacific, near Kennet, Cal., a freight train was derailed and the engine and six cars fell down a bank. The fireman was injured.

9th, on Chicago Great Western, near Brownsdale, Minn., a freight train was derailed and the engine and tender were ditched. The engineman and fireman were injured.

9th, on Baltimore & Ohio, near Metz, W. Va., the caboose and the rear car of a freight train were derailed and the conductor and one brakeman were injured.

10th, on Wabash road, near Kellers, Ind., a freight train was derailed and the engineman and fireman were injured.

11th, on Central of New Jersey, at Mauch Chunk, Pa., several cars in a freight train were derailed, and ran against a car inspector's cabin, killing two employees who were in the building.

12th, on New York, New Haven & Hartford, at Bridgeport, Conn., a car in a freight train was derailed and ran against a scale house, knocking it down. An employee inside the building was killed and another injured.

17th, on Atchison, Topeka & Santa Fe, at Red Rock, I. T., the caboose of a freight train was derailed and, after running some distance, was overturned and fell down a bank. The conductor and one brakeman were killed.

22d, on Louisville & Nashville, near Pelham, Ala., a freight train was derailed on a bridge and one of the cars ran against the truss, weakening it so that the bridge, a single span 120 ft. long, with 10 cars, fell to the stream 40 ft. below. One brakeman was injured.

24th, on Burlington, Cedar Rapids & Northern, near Burlington, Ia., passenger train No. 6 was derailed and the passenger car fell down a bank, rolling over twice. Two passengers were killed and three injured.

25th, on Atchison, Topeka & Santa Fe, near Great Bend, Kan., a freight train was derailed and 14 cars were ditched. An employee riding in the caboose was injured.

25th, on Burlington & Missouri River, at Ayr, Neb., a mixed train was derailed and the engine and several freight cars were ditched. A brakeman was injured.

26th, on Baltimore & Ohio, at Ninety-first street, South Chicago, Ill., a freight train was derailed and one of the cars knocked over a timber pillar supporting a flagman's cabin. The cabin fell in ruins, and, taking fire from the stove, was entirely consumed. The flagman fell with the building, but was only slightly injured.

26th, on Pennsylvania road, near Bellefonte, Pa., the engine of a passenger train was derailed on a high trestle, and broke through the floor. The engineman jumped off and was badly injured.

28th, on Southern Railway, near Swain, Miss., a passenger train was derailed and the passenger car fell into the ditch. Several passengers were injured.

29th, on Union Pacific, near Genoa, Neb., a mixed train was derailed and the passenger car, baggage car and one freight car fell down a bank. Seven passengers were injured.

30th, on Mobile & Ohio, near Oraville, Ill., a locomotive running backward was derailed and fell down a bank. The fireman was killed and the conductor, one brakeman and engineman were injured, the two latter fatally.

And 45 others on 37 roads, involving 4 passenger and 41 freight and other trains.

## OTHER ACCIDENTS.

5th, on Birmingham Mineral road, near Valley Creek, Ala., the cab of a locomotive of a freight train was wrecked by a tree which was blown upon it, and the engineman was badly injured.

20th, on Chicago & Erie, near Converse, O., the locomotive of a freight train was wrecked by the explosion of its boiler. The fireman was killed and three other trainmen were badly injured. Twenty cars were badly damaged.

23d, 9 p. m., on Cincinnati, Hamilton & Dayton, near Jones, O., the locomotive of a freight train was wrecked by the explosion of its boiler and 23 cars were badly damaged. The fireman was killed and three other trainmen were injured, one of them fatally.

24th, on Denver & Rio Grande, near Swallows, Col., the locomotive of a freight train was wrecked by the explosion of its boiler. A bridge of the Atchison, Topeka & Santa Fe nearby took fire and, with 20 loaded freight cars and other property, was burned. The fireman and one brakeman were killed and three other trainmen were injured. It was found that the explosion had been due to low water in the boiler.

26th, on Florida, Central & Peninsular, at Waldo, Fla., the locomotive of a passenger train was wrecked by the explosion of its boiler, and the engineman was killed. The fireman was not on the engine at the time. It is said that not enough water had been kept in the boiler.

And 3 others, involving 1 passenger train and 2 freight trains.

A summary will be found in another column.

## Recent Scherzer Rolling Lift Bridges.

In our issue of December 2 we noted the decision of the Sanitary District, Chicago, to build two Scherzer rolling lift bridges over the Chicago River, one to carry Taylor street, and the other the tracks leading into the Grand Central Station on Harrison street. These bridges will replace old center pier swing bridges, which now form such an obstruction that to get the required water for the Drainage Channel it was necessary either to make by-passes around the present bridges or build lift bridges without center piers. Incidentally the adoption of the latter plan will greatly improve the river for navigation. It was found that rolling lift bridges at these points would cost about $95,000 less than the by-passes. The Sanitary District has bought the plans and the right to build these bridges under the patents of the Scherzer Rolling Lift Bridge Company, and that company will superintend the construction.

The railroad bridge is situated between Taylor street and Twelfth street, and eventually will be a four-track, double-leaf, rolling lift bridge, consisting of two double-track units, which can be worked singly or together by electric motors. For the present one unit only, or a two-track bridge, will be built, together with certain portions of the foundations for the entire structure. On account of the location of the tracks, this bridge must be built on such a skew (the angle being 35 degrees) that the distance from center to center of bearings becomes 277 ft., in order to get a clear opening between the

protection piling of 120 ft., this being the width of channel required by the Government engineers. This will be the longest movable lift bridge so far built, and if the crossing were at right angles the clear channel would be about 260 ft. wide.

The superstructure will be a double leaf, cantilever through truss of the Scherzer type, designed according to Cooper's specifications for railroad bridges, using a uniform loading of 5,000 lbs. per lin. ft. of track and concentrated loads of 50,000 lbs. at any point. The bottom of the floor beams will be 4 ft. above high water, the vertical clearance 22 ft. above the base of the rail, while the trusses of either unit will be 29 ft. center to center.

The Taylor street bridge will have a skew angle of 72 degrees, and will be 156 ft. between centers of bearings, to give a clear channel of 120 ft. It will be a deck rolling lift bridge, with an 18-ft. roadway and two sidewalks, each 5 ft. wide. The lower chord will be arched, and when the bridge is closed there will be at the middle a clearance of 27 ft. above the water, so that tugs and low vessels can pass without opening the bridge. This bridge was designed according to Cooper's specifications for highway bridges, using uniform loads of 100 lbs. per sq. ft. of roadway, and concentrated loads sufficient to provide for the heaviest electric cars.

The Scherzer Company has also designed for the Cleveland, Cincinnati, Chicago & St. Louis a single-leaf, rolling lift bridge to carry one track across the Cuyahoga River at Cleveland. This is a through span, 125 ft. between bearings, giving a clear channel opening of 110 ft. The bridge is building and will be completed about March next.

Work has been begun with a large force on the eight-track Sanitary District bridge near Campbell avenue, and it will be carried on day and night until completed. This bridge was also designed by the Scherzer Company, which company secured the contract August 6 last, but was restrained by a preliminary injunction from proceeding with the work. Recently, we are informed, upon a hearing, the bill was dismissed, and an appeal not being taken within the allowed time the litigation was brought to an end. The six-track, single-leaf, rolling lift bridge for the New York, New Haven & Hartford, near the entrance to the new South Union Station, Boston, is also under way, but will require from three to six months for its completion.

## Some Notes on Light Railroads.

(Continued from page 919, issue of Dec. 23 last.)

### A Study in Acceleration.

In Figs. 1 and 2 has been plotted a curve from observed records of tests made at Schenectady last summer, and also a representative speed curve from records on the Manhattan elevated, New York. In studying this subject some have assumed the general equation of acceleration curves to be,

$$V^2 = aS - bS^2 \ldots\ldots (1),$$

in which V is the velocity in feet per second, S the distance run in feet to reach a velocity V, and a and b are constants depending on conditions and determined for each curve. These constants are obtained by taking two or more values for V and S from a curve plotted on speed-distance axes and solving these independent equations for a and b. For a curve that nearly coincides with the lower curve in Fig. 1 Mr. D. L. Barnes found a to equal 1.88 and b .00024.*

In order to get the total drawbar pull in tons of 2,000 lbs. for any distance from the starting point it is necessary to simply get an expression for the acceleration and place it in the fundamental equation $p = Mf$, where p is the pull in tons, M is the mass $\frac{W \text{ (wt. in tons)}}{g \text{ (acceleration due to gravity)}}$ and f is the acecleration of the train, which may be expressed analytically by the ratio $\frac{d^2S}{dt^2}$. Substituting in and reducing this equation we obtain:

$$p = \frac{W}{32.2}\left(\frac{a}{2} - bS\right)^{\dagger} \ldots\ldots (2)$$

Where a and b are the same constants as appear in equation (1).

Plotting the drawbar pull from this equation for the Manhattan record (assuming a 130-ton train on a level track), we find that the total work done up to the time of putting on the brakes, or about 1,200 ft., is represented by the area A B C D. The area C D E F represents approximately the amount of work required to overcome the friction of the train, as plotted by Mr. Barnes. The line AB is of necessity a straight line for all train loads, inasmuch as the equation (2) contains only the first power of the variable S.

In order to test equation 2 for an extreme case we have assumed that a train weighing 130 tons is pulled by a locomotive, the acceleration of the train being represented by the speed curves plotted from one of the Schenectady tests, as shown in Fig. 1. In order to determine the constants for this curve six values of V with the corresponding values of S, as determined from the upper curve in Fig. 1 (taking V in feet per second) were substituted in equation (1). These quadratic equations were solved in pairs, giving five independent values of the constants, the average values being a = 10 and b = .0072. These constants are about twice as large as those worked out by Mr. Barnes for a representative retardation curve on the Manhattan Elevated. From comparisons of a number of curves it is evident that the values of the constants become larger as the acceleration increases. Working out the values for the special Schenectady test, we find that if equation 1 is true for the curve (Fig. 1), the area M N D, Fig. 3, shows the work done in accelerating the train up to the maximum speed. Thus it will be seen that after the train has run about 700 feet the equation will show a drawbar pull equal to zero. We know, however, that after this distance has been run the locomotive would have considerable work to do, for in this special case it would have about 400 ft. to go before the maximum speed is reached.

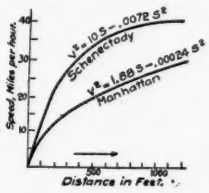



Fig. 1.

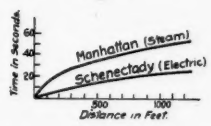



Fig. 2.

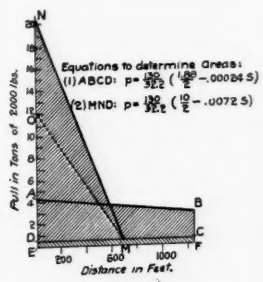

Equations to determine Areas:
(1) ABCD: $p = \frac{130}{32.2}\left(\frac{10}{2} - .00024S\right)$
(2) MND: $p = \frac{130}{32.2}\left(\frac{10}{2} - .0072S\right)$
Pull in Tons of 2000 lbs.
Distance in Feet.

Fig. 3.

Attention might be called to another limiting condition which a use of this equation imposes. To show graphically just what is referred to, calculations have been made for a 90-ton train, using formula 2. The result of this substitution has been plotted, the area M O D representing approximately the work done in accelerating the train. As in previous calculations, the pull is zero at a distance of 700 ft. from the starting point. Testing the equation we find it will give zero at this distance, regardless of the weight of the train. This, of itself, however, does not necessarily prove the equation inconsistent. Probably enough has been said to show at least one case where the more common mathematical analysis will not give even approximate results. What is needed, to begin with, is an equation that will be true for all acceleration curves, whether the acceleration is variable its entire run in getting up speed, or whether it is uniform a part of the distance. We cannot state the form of the equation which would best answer these conditions, and question whether any really simple form can be of unlimited application. One can see where well-grounded work along lines as may be suggested by a reading of the above would prove of real value to students, and might add some good material to the literature on the subject.

The above is given as a study, for the purpose of indicating to any who might be working along similar lines, the dangers of using formulas without knowing their limitations. The principles here considered are fundamental, and a proper application of them should lead to some interesting results.

*Proceedings of the Western Railway Club, 1893-4, p. 327.

† This result is obtained as follows by aid of the calculus:

$V^2 = aS - bS^2$ (general equation), but $V = \frac{dS}{dt}$ for variable velocity.

Therefore $\frac{dS^2}{dt^2} = aS - bS^2$, from which $2dS\frac{d^2S}{dt^2} = adS - 2bSdS$.

Dividing through by $2dS$

$$\frac{d^2S}{dt^2} = \tfrac{1}{2}a - bS,$$

but $\frac{d^2S}{dt^2}$ is the general analytical expression for the acceleration f. Therefore we may write in our general equation, $p = Mf$. the values as determined for curves of this kind:

$$p = \frac{W}{32.2}\left(\frac{1}{2}a - bS\right)$$

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The purpose of the notes on street railroad costs, printed in the Railroad Gazette Dec. 23 last, has apparently been misunderstood by some. The question discussed was not one relating to the best system for crowded city streets. That is believed to have been settled from a somewhat extended experience with the conduit electric roads, and the writer expressed the consensus of opinion on this point in the statement: "The conduit electric is superior for many reasons to the cable and trolley." The main point touched upon was referred to in the last part of the sentence, "the cost of working the cars by the three methods (trolley, conduit electric and cable) should not vary widely." The purpose of this broad statement was to anticipate the absurd inference that some unacquainted with the subject might draw from the Metropolitan (New York) figures, to the effect that a similar relation of expenses might be looked for in various systems in other cities. The statement may not hold true at all for different systems in any particular city, as in New York. Each city has its peculiar conditions to meet, and this is well brought out by a study of Mr. Vreeland's figures; nor is there reason to believe that because Chicago can operate its cable road for about 11 cents a car mile, other cities can use to advantage the methods successful in Chicago. The figures which were given in the article, were designed primarily to show that a wide difference is evident in the working expenses of roads in the two cities, and the remark just quoted is simply a general statement of a well known fact.

The publication of such figures should produce only good results, for it may lead those studying the question for any particular city to broaden their investigation, and not accept as representative the figures given out for New York City. We are aware that figures could probably be collected which would show almost any result desired, but of themselves such figures would carry little weight with engineers making an impartial report for any city.

A. J. W.

## The Fast Mail Trains.

The fast mail trains between Chicago and Council Bluffs continue their trips, but no unusual speeds have been recorded since those which were noted in the Railroad Gazette last week. The reports of speeds higher than 90 miles an hour on the Chicago & Northwestern do not seem to have been confirmed by officers of the road. The passenger department of the Burlington has issued an advertising circular containing the record of the very fast eastbound run made over that road. On this run engines were changed only twice, at Creston and at Burlington. From Galesburg to Mendota, 79.7 miles, this train took only 73 minutes, the time being taken from start to stop; from Mendota to Aurora, 45.4 miles, 40.5 minutes, start to stop. The train arrived in Chicago exactly on time. Between Chicago and Burlington Columbia type locomotives are used for the Burlington fast mail, but west of the Mississippi the company's ordinary engines are used. The Chicago & Northwestern fast train is drawn by the company's standard Schenectady 10-wheel passenger engine. The Burlington is having two new high-speed locomotives built at the Baldwin Works. The Rock Island road last Sunday put on a train to leave Chicago at 7:55 p. m. and run through to Council Bluffs in 11 hours 40 minutes. This train connects with the fast mail from New York over the Lake Shore at Englewood, seven miles out of Chicago, and thus saves considerable time; but what is saved here is lost by the slower time on the road.

The schedule time of the fast mail trains from New York to the Pacific Coast is as follows:

| | | | |
|---|---|---|---|
| Lv. | New York | Monday | 9:15 p. m. |
| Ar. | Buffalo | Tuesday | 8:10 a. m. |
| Lv. | Buffalo (L. S) | " | 7:15 a. m. |
| Ar. | Chicago | " | 8:30 p. m. |
| Lv. | Chicago (C. B. & Q.) | " | 9:30 p. m. |
| Ar. | Council Bluffs | Wednesday | 7:55 a. m. |
| Lv. | Council Bluffs (U. P.) | " | 8:30 a. m. |
| Ar. | Cheyenne | " | 10:25 p. m. |
| Lv. | Cheyenne | " | 10:45 p. m. |
| Ar. | Ogden | Thursday | 1:45 p. m. |
| Lv. | Ogden (Pac time) S. P | " | 1:10 p. m. |
| Ar. | Reno, Nev | Friday | 9:05 a. m. |
| Ar. | Sacramento | " | 4:00 p. m. |
| Ar. | San Francisco | " | 8:15 p. m. |
| Lv. | Green River (O. S. L) | Thursday | 8:30 a. m. |
| Ar. | Portland (O. R. N.) | Friday | 5:15 p. m. |

From New York to San Francisco, 3,332 miles; time, 98 hours; rate, 34 miles an hour. New York to Ogden, 2,498 miles; time, 66 h. 30 min.; rate, 37.51. New York to Council Bluffs, 1,464 miles; time, 35 h. 40 min.; rate, 41.05. New York to Chicago, 964 miles; time, 24 h. 15 min.; rate, 39.75. All these rates include the stops. It will be observed that the rate from New York to Council Bluffs is faster than from New York to Chicago, the very fast rate over the Burlington (48) more than making up for the time lost in Chicago. The rate over the Union Pacific (1,034 miles) is 34.2; over the Southern Pacific (834 miles) 27.

## Foreign Railroad Notes.

The Russian Trans-Caspian Railroad seems to be somewhat deliberate in the movement of its trains, of which there are four each way weekly, no trains leaving Mondays, Wednesdays and Fridays from the Caspian terminus, and none from Samarcand on Sundays, Tuesdays and Fridays. The train is 63 hours going from Krasnovodsk (on the Caspian), to Samarcand, a distance of 940 miles—about 15 miles an hour. This railroad is still worked by the War Department, which built it, and not by the Transportation Department, which works the other government railroad.

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In Siam a railroad charter, like other grants by the King, is called a "wind fall," though it is the "fall" and not the "wind" which gives it its name. This is the way of it: Until within some 20 years, all persons approaching His Majesty—not his slaves only, but his Ministers of State—did so on all fours, and so remained during the audience. Papers which the King was graciously pleased to approve he shoved off his table and they fell upon the floor; and the petitioner, or his agent, gathered up these "falls." So, when a Siamese tells you his request is "ta klong," literally "fallen down," he means that it is granted. The country has two railroads, one about 12 miles long, built by a Danish company, and the other, of which about 80 miles are open, built for the Government by a German engineer and worked largely by Germans.

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At 32 Park Place, New York.

## EDITORIAL ANNOUNCEMENTS.

**Contributions.**—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussion of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

**Advertisements.**—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially either for money or in consideration of advertising patronage.*

At the last annual meeting of the American Society of Civil Engineers a resolution was introduced looking toward discontinuing the practice of indicating time in the official publications of the Society by the 24-hour notation, as, for instance, calling the meetings of the Society at 20½ o'clock instead of half-past eight. This resolution was defeated, principally on the ground of discourtesy to the gentlemen who for the last generation have tried hard to reform time notation; and on the ground that a change of such importance should not be made without consulting a larger percentage of the membership than was present at the meeting. The whole discussion may be found in the February, 1898, Proceedings, where it fills about eight and one-half pages. It is likely that the same matter will come up again this year. The question is not the general one of the use and convenience of the 24-hour system of notation if that system could be universally adopted. The practical question is whether or not it is wise to continue the use of this notation in the official publications of the Society. For a dozen years, more or less, this method of time designation has been used in those publications without any effect whatever. For all practical purposes it is true that the notation is still foreign and unfamiliar to the members. Even the Secretary, when he makes a verbal announcement, uses the familiar designations known to mankind, and then stops and corrects himself, while a smile goes round the house. No one takes it seriously. But even a fairly good joke gets tiresome after a dozen years of steady use, and a dozen years of steady use cannot make us really enjoy a poor joke. To uphold a great principle year after year through ridicule and persecution is noble; it will surely do good sooner or later. The effect on your own character is alone a sufficient reward. But to stick to a hopeless fad is mere crankiness. It diminishes your influence and usefulness in the world because it makes people distrust the strength of your judgment in really important things.

## The Relation Between Power and Speed of Locomotives.

It would seem, as the result of the experiments made by Prof. Smart and Mr. Vauclain, and presented before the St. Louis Railway Club (see the Railroad Gazette, 1898, page 927), that it will be necessary to modify prevailing opinions as to the relation which exists between the power and speed of modern compound and single expansion locomotives. The statement that the power of the locomotive decreases to an important extent after a certain speed is reached, while undoubtedly holding for engines built but a few years ago, has now been pretty conclusively shown to be untrue for certain recent designs. This improvement has been brought about by changes in locomotive valves and valve gear, which in turn have resulted in so much better steam distribution that we are now led to believe that the power of compound locomotives of the Vauclain type and some single expansion high speed engines increases more nearly in direct proportion to the speed than is generally known. We cannot, however, agree that the facts presented by Prof. Smart and Mr. Vauclain are sufficient to warrant the statement that a direct proportion exists between power and speed, or to warrant drawing a straight line through the origin of the diagram to represent the changes in power with different speeds.

If we should take such a line to represent the power curve, it follows directly that the mean effective pressure in the cylinders must be constant at all speeds. Thus, such a straight line would mean that the horse-power equals the slope of the line multiplied by the speed; we also know that the horse-power equals the speed multiplied by the mean effective pressure and by a constant. Now, if these expressions for horse-power be combined we find that the mean effective pressure is equal to the slope of the line divided by the horse-power constant, which quotient, in the case of a straight line, is a constant. It also follows that if the mean effective pressure decreases with the speed, the power curve must be represented by some curve which falls below a tangent to that curve through the origin; and it cannot be a straight line.

The laboratory tests of the compound model showed that, with the reverse lever in the first notch, the sum of the mean effective pressures in the high and low pressure cylinders was 82.5, 68.7 and 61.6, corresponding to 117, 182 and 250 revolutions per minute, and with the reverse lever in the second notch the sum of the mean effective pressures was 90.9, 87.6, 79.4 and 77.2 at 118, 168, 233 and 273 revolutions per minute respectively. Mr. Vauclain does not give the values of the mean effective pressures at different speeds for the road tests, but from certain indicator diagrams shown, but not reproduced in our extracts, it is evident that a drop in the mean effective pressure did occur with increases of speed, but the drop was not nearly so great as with locomotives built a few years ago. It follows that the straight line power diagrams are not strictly correct as indicating the direction of the line of horse-power, but this objection does not materially affect Mr. Vauclain's conclusions or the explanation of the splendid performance of the high speed compounds on the Chicago, Milwaukee & St. Paul and the Atlantic City roads.

Such good results were not anticipated a few years ago by able writers on locomotive subjects. Thus, in Mr. D. L. Barnes' book, Compound Locomotives, published in 1893, a chapter is given to the reduction in the mean effective pressure due to speed, and several diagrams are shown clearly illustrating this effect for what was termed the ordinary and best valve gear. The following statement is significant, and undoubtedly true of the locomotives which that writer was considering: "It is clear from these diagrams that at high speeds almost the entire power of the locomotive cylinders is consumed by the locomotive and tender, or the locomotive and tender resistance increases greatly, but almost solely because of the decrease of mean effective pressure in the cylinders brought about by wire-drawing, compression and early cut-off at high speeds."

The results of the laboratory tests of the first single expansion locomotive at Purdue University have also had an important effect in confirming previous opinion as to the effect of speed on the power of locomotives. In a paper before the Western Railway Club in 1896, Prof. Goss showed that for the particular locomotive tested the speed which resulted in the greatest power and maximum efficiency was about 35 miles per hour, or approximately 200 revolutions per minute, which was termed the "critical speed;" beyond this speed both the power and efficiency decreased. With these results as a basis, an interesting argument was presented in favor of designing high speed engines with driving wheels of such size that the greater part of their work would be done at the "critical speed."

It is apparent from Mr. Vauclain's tests that an important improvement has been made in the valve gear of modern high speed locomotives, which has resulted in placing the point of "critical speed" beyond the present possibilities of locomotive running; also by using compound cylinders a wider range of economical working is obtained than is possible with single expansion engines. While this is probably the most interesting point brought out by these tests, the greater hauling capacity and efficiency of the compound over single expansion locomotives for fast service should not be overlooked.

## November Accidents.

Our record of train accidents in November, given in this number, includes 112 collisions, 119 derailments and 8 other accidents, a total of 239 accidents, in which 40 persons were killed and 169 injured. The detailed list, printed on another page, contains accounts only of the more important of these accidents. All which caused no deaths or injuries to persons are omitted, except where the circumstances of the accident as reported make it of special interest.

These accidents are classified as follows:

| Collisions. | Rear. | Butting. | Crossing and other. | Total. |
|---|---|---|---|---|
| Trains breaking in two | 10 | 0 | 0 | 10 |
| Misplaced switch | 2 | 3 | 4 | 9 |
| Failure to give or observe signal | 4 | 1 | 4 | 9 |
| Mistake in giving or understanding orders | 0 | 1 | 0 | 1 |
| Miscellaneous | 17 | 3 | 13 | 33 |
| Unexplained | 18 | 17 | 15 | 50 |
| Total | 51 | 25 | 36 | 112 |

| Derailments. | | | |
|---|---|---|---|
| Broken rail | 2 | Broken car | 2 |
| Loose or spread rail | 1 | Rupture of brake hose | 2 |
| Defective bridge | 1 | Misplaced switch | 3 |
| Defective switch | 1 | Track repairers | 1 |
| Broken wheel | 6 | Runaway train | 3 |
| Broken axle | 12 | Derailing switch | 3 |
| Broken truck | 3 | Animals on track | 4 |
| Fallen brakebeam | 2 | Snow | 5 |
| Failure of drawbar | 3 | Accidental obstruction | 3 |
| Automatic application of brakes, following failure of drawbar | 1 | Unexplained | 61 |
| | | | 119 |

| Other Accidents. | |
|---|---|
| Boiler explosion | 4 |
| Broken side rod | 1 |
| Other causes | 3 |
| | 8 |
| Total number of accidents | 239 |

A general classification shows:

| | Collisions. | Derailments. | Other accid's. | Total. | P. c. |
|---|---|---|---|---|---|
| Defects of road | 0 | 5 | 0 | 5 | 2 |
| Defects of equipment | 10 | 31 | 7 | 48 | 20 |
| Negligence in operating | 52 | 10 | 0 | 62 | 26 |
| Unforeseen obstructions | 0 | 12 | 1 | 13 | 5 |
| Unexplained | 50 | 61 | 0 | 111 | 47 |
| Total | 112 | 119 | 8 | 239 | 100 |

The number of trains involved is as follows:

| | Collisions. | Derailments. | Other accid's. | Total. |
|---|---|---|---|---|
| Passenger | 32 | 19 | 2 | 53 |
| Freight and other | 178 | 101 | 6 | 285 |
| Total | 210 | 120 | 8 | 338 |

The casualties may be divided as follows:

| Killed: | Collisions. | Derailments. | Other accid's. | Total. |
|---|---|---|---|---|
| Employees | 15 | 15 | 6 | 36 |
| Passengers | 0 | 2 | 0 | 2 |
| Others | 2 | 0 | 0 | 2 |
| Total | 17 | 17 | 6 | 40 |
| Injured: | | | | |
| Employees | 81 | 31 | 9 | 121 |
| Passengers | 16 | 30 | 0 | 46 |
| Others | 1 | 1 | 0 | 2 |
| Total | 98 | 62 | 9 | 169 |

The casualties to passengers and employees, when divided according to classes of causes, appear as follows:

| | Pass. Killed. | Pass. Injured. | Emp. Killed. | Emp. Injured. |
|---|---|---|---|---|
| Defects of road | 0 | 0 | 2 | 2 |
| Defects of equipment | 0 | 0 | 6 | 10 |
| Negligence in operating | 0 | 21 | 15 | 83 |
| Unforeseen obstructions and maliciousness | 0 | 12 | 5 | 10 |
| Unexplained | 2 | 13 | 8 | 16 |
| Total | 2 | 46 | 36 | 121 |

Twenty-five accidents caused the death of one or more persons each, and 52 caused injury but not death, leaving 162 (68 per cent. of the whole) which caused no personal injury deemed worthy of record.

The comparison with November of the previous five years shows:

| | 1898. | 1897. | 1896. | 1895. | 1894. | 1893. |
|---|---|---|---|---|---|---|
| Collisions | 112 | 92 | 49 | 80 | 59 | 92 |
| Derailments | 119 | 111 | 54 | 62 | 84 | 101 |
| Other accidents | 8 | 8 | 4 | 4 | 3 | 7 |
| Total accidents | 239 | 211 | 107 | 146 | 146 | 200 |
| Employees killed | 36 | 23 | 10 | 38 | 17 | 43 |
| Others killed | 4 | 8 | 4 | 8 | 5 | 28 |
| Employees injured | 121 | 85 | 41 | 87 | 47 | 108 |
| Others injured | 48 | 106 | 14 | 82 | 19 | 87 |
| Passenger trains involved | 53 | 48 | 29 | 49 | 44 | 66 |
| Average per day: | | | | | | |
| Accidents | 7.97 | 7.03 | 3.57 | 4.87 | 4.87 | 6.67 |
| Killed | 1.33 | 1.03 | 0.47 | 1.53 | 0.73 | 2.37 |
| Injured | 5.63 | 6.37 | 1.83 | 5.63 | 2.20 | 6.50 |
| Average per accident: | | | | | | |
| Killed | 0.17 | 0.15 | 0.13 | 0.32 | 0.15 | 0.35 |
| Injured | 0.71 | 0.91 | 0.51 | 1.16 | 1.45 | 0.97 |

Only one train accident is reported in the United States in November which was fatal to passengers, that near Burlington, Ia., on the 24th. The other most notable passenger train accidents were those at Newport, Pa., on the 11th; Florence, N. J., on the 18th, and Georgetown, Conn., on the 26th. The report of the investigation of the Newport collision states that the engineman of the train which got beyond control was a man usually employed on a pushing engine, and that he was running this passenger train for the first time. The Florence collision affords a striking example of the need of space interval regulations. The Georgetown accident, which was remarkably fortunate in its results, was due to a cause which very rarely appears in the accident record, a broken steel tire.

On the 7th the engineman of a fast freight train near Glendale, Mo., on the Chicago & Alton, died while sitting in his cab, and his condition was not

discovered by the fireman for some minutes afterward. On the 4th, near Columbiana, O., on the Pittsburgh, Ft. Wayne & Chicago, the fireman of a night passenger train, discovering that the engineman was absent from the cab, found that he had fallen to the ground at a point some distance back, probably from the running board. The engineman was fatally injured. Near Jersey City, N. J., on the Pennsylvania, Nov. 18, 12 trackmen were run over and killed. On the 26th, near Oxford, N. Y., on the Delaware, Lackawanna & Western, six trackmen, including the foreman, were crushed and badly injured by a car of rails which fell over upon them. In unloading the car one side was lightened too much and the body of the car, with its partial load, was overturned, the trucks remaining in position on the track. Near Otis, Ind., on the Lake Shore & Michigan Southern, on the night of Nov. 24, two handcars loaded with men and women going home from a ball were struck by the fast mail train, and four persons were killed or fatally injured.

There was a disastrous collision on the Grand Trunk near Trenton, Ont., at 3 a. m., Nov. 15. A west-bound passenger train ran over a misplaced switch and into the head of an east-bound freight train. Both engines and several cars were badly wrecked. The baggage car was pushed back almost completely through the second-class passenger car. Both enginemen, one fireman and nine passengers were killed, and three trainmen and 10 passengers were injured. The misplaced switch was at the end of a 7-mile section of single track. The passenger train was thrown upon the east-bound track and ran about a mile before meeting the freight. At the coroner's investigation and elsewhere there was much speculation concerning the reason why the engineman failed to stop before entering upon the double track, but no explanation was found. The theory was broached that the engineman had died from apoplexy or heart disease before reaching the signal which warned him that the switch was not right, but we do not learn that any autopsy was made on his body, and it is said that sand was found on the track, showing that the engineman had made efforts to stop before he collided with the freight. But the dead fireman of the passenger train was found in a position showing that he had been shoveling coal at the moment when he met his death. The passenger engineman was about 45 years old, had an excellent record, had run this train a number of years, had been on duty but one hour when the accident occurred, and had been off duty 16 hours immediately before. In the normal position the switch is right for east-bound trains, and west-bound trains have to call for it by a whistle signal.

We have reports of 14 street car accidents in the United States in November, in which 24 persons were injured. The causes are in the usual variety. In one case on Staten Island four cars were mixed up in a rear collision because the signal lights had gone out. At Council Bluffs, Ia., a car was run into by a locomotive because the trolley came off while the car was on a crossing. At Newark, N. J., there was a runaway due to the failure of a brake chain.

A good deal of interest has been aroused by the statement made in the daily papers that a contract has been let for building 250 compressed air trucks for use in the streets of New York City. The facts, as we get them from the International Air Power Company, are briefly these: That company will have 250 such trucks built. They will be adapted for light and heavy trucking in city streets and will be self propelling, and worked by compressed air under the patents and designs of Messrs. Hoadley & Knight. They will not be sold, but will be run by either the International Company or an auxiliary company, organized especially to do trucking business. It is apparent that at the outset, at least, it would be obviously good policy to keep the handling and control of the trucks in a concern which can give them intelligent care and which has a great stake in making them successful, for it is not supposable that the start will be entirely without difficulties. The present notion is that there will be three compressing stations in the lower part of the city of New York, in order that the trucks need not go far to re-charge. They will be fitted with the necessary draw hooks, so that any one of them can haul a trailer or can be hauled by another truck. It is possible that the installation will include a number of trucks designed merely as locomotives or as patrol trucks. It might be desirable to have quite a number of such, but of course this can only be decided after the actual work has begun. As to whether or not this method of handling the trucking business of the city of New York, or of any other great American city, will be much crippled by poor pavements can only be decided by trial. It seems probable that such an enterprise would lead directly to the improvement of the pavements. It does not require much imagination to foresee the immense development of this kind of trucking when the successful machines and methods are found. Whether or not many of this first lot of 250 trucks will be built at Worcester, as the newspapers have said, is apparently still uncertain. The International Company and its associates have bought the Rhode Island Locomotive Works, and it is expected that these will be put in shape immediately for building automobile trucks and carriages, and compressed air cars and locomotives, on a large scale.

At Washington last Wednesday week there was a conference between members of the Interstate Commerce Commission and representatives (mostly presidents) of the principal railroads north of the Ohio and east of the Mississippi; and the Commissioners, who called this conference, have invited the railroad men to another one this week. The Pennsylvania was the only prominent line not represented. Nothing is given out as to what was done, and the absence of mention of the matter in most of the daily papers indicates that unusual efforts were put forth to preserve the privacy of the affair. Presumably the chief aim of the Commissioners was to see what and how many other roads were disposed to join the receivers of the Baltimore & Ohio in their resolve to publish all their rates and expose all rate cutters. Whatever the outcome, it is a matter for congratulation that the Commissioners are disposed to enter into friendly conferences with the railroads. Co-operation between the representatives of the Government and the managers of the railroads has long been desirable, as we have before remarked. Says a western paper: "A broad-gaged chairman is largely responsible for this change in Washington, and the attitude of the Commission would now appear to be in the direction of seeking the co-operation of the railroads for the observance of the law, rather than antagonizing the managers. The conference is not intended to be a scolding talk, but a free discussion of the existing conditions, and a friendly interchange of views concerning the absolute maintenance of published tariffs."

Freight rates seem to be firm throughout Trunk line and Central territory, though no agreement has been made, unless it be the so-called "gentlemen's agreements," made at dinner parties. At Chicago, Louisville, Cincinnati, St. Louis, Buffalo and New York, the newspapers all report that the local freight agents are under orders not to make reductions from the tariffs, and thus far the orders seem to be intended to be obeyed. At Chicago, one grain shipper says that he has just shipped 500,000 bushels of grain to the seaboard at tariff rates and that this is the first time that he has had to pay full rates in five years. Another western news item, published as a novelty, is to the effect that the Pennsylvania has made a contract for moving 1,000,000 bushels of corn from the Mississippi River to Philadelphia and Baltimore at full tariff rates.

## The Westinghouse Air Brake Instruction Car.

The introduction of the air brake opened up a new art, an art involving the care and use of a powerful, highly organized and sensitive mechanism, and involving also new questions in handling trains and in the discipline of men. This art was not launched on the world fully organized, and it is not likely that anyone foresaw how much of an art it was destined to be. It had to be developed by experience. Fortunately, the air brake business was in the hands of men who took large views. They realized very early that their business was not a mere matter of making and selling so many sets of air brakes, just as one would sell so many cast iron car-wheels, and they organized an elaborate department of inspection and education. A group of remarkably able mechanical engineers were taken into the employ of the company and a number of the most intelligent and enterprising locomotive enginemen in the country have gradually been absorbed into this service. The systematic education of railroad officers and employees has been carried on by these men by various means—by conversations and correspondence, by writing and publication, by discussions in the associations and societies, and by the air brake instruction car, the work of which is the special topic of this paper. If a railroad accident happens which might have been the result of inefficient braking, a Westinghouse inspector is apt to appear on the ground pretty promptly, and if there was any defect in the maintenance of the brake or brake gear, or in the manipulation of the apparatus the responsible officers of the railroad concerned will probably know it before the Westinghouse man has done with the case, although the public may never know it.

Obviously, all this work costs money. Probably the Westinghouse Air Brake Company spends $50,000 a year in work which has nothing to do directly with the manufacture and sale of air brakes or with defending its patents. This sum is expended merely to increase the efficiency of the brakes owned by the railroad companies. Naturally, this is not done for philanthropy, but the work carried on with so much ability, at such cost, and with results so valuable to the railroads and to the public, is a fine example of the utility of "enlightened self-interest." It is perfectly safe to say that in the art of train braking we in the United States are years ahead of any other country in the world. While this is true of the apparatus itself in power and quickness, it is perhaps still more true in the widespread and accurate knowledge of the possibilities of the mechanism. Of course, the Westinghouse air brake is used largely in England, on the Continent of Europe and in the British colonies, but among all the Westinghouse equipment used abroad the percentage of the latest quick action brake is doubtless considerably less than it is in the United States, and we suppose the "high-speed brake" is entirely unknown in foreign practice. Furthermore, there is a large amount of passenger equipment in Great Britain (and, relatively, a smaller amount on the Continent) equipped with the automatic vacuum brake, which cannot be compared with the Westinghouse for all around efficiency, for fundamental mechanical reasons which we need not go into here, but which the mechanical engineer will appreciate at once.

But, as we said above, it is probable that the difference in the knowledge and skill of officers and men is greater than the difference in apparatus, when comparison is made between the United States and other countries, and this superior skill is due more to the intelligent and systematic efforts of the Westinghouse Company than to all other influences combined, and one of the most important influences in this valuable education is the instruction car, the work and equipment of which we propose to briefly describe.

The Westinghouse air brake instruction car has been in service now for about 10 years, and on Nov. 17 the number of men who had passed through it amounted to 126,850. Mr. Hutchins, who has long been the president and principal lecturer in the faculty of this modern college of applied science, claims that his institution has more alumni than any other college in the world. Furthermore, it is a very agile sort of college, and up to Nov. 17, of this year, had traveled 58,856 miles.

The car is moved from one road to another, in the order of application for its services, and remains at any one point as long as may be necessary. The course of training is excellently organized. Before the car arrives at some one point for work a list has been prepared of all the men who can be instructed at that point. This includes engine drivers, firemen, conductors, trainmen and any others whom the officers of the railroad wish to put through the car. In fact officers' classes are sometimes organized. These lists are written alphabetically, on well designed blanks, on which the record of each man's attendance and performance at the air brake college is made. At the end of his course, longer or shorter, he receives if he is qualified, a certificate, an example of which follows:

Form 110.

No..... .....189

The following named employee of the .....R. R. was examined as to his knowledge of the construction and operation of the Westinghouse Automatic Air Brake:

Name, .....

Occupation, .....

General Average Proficiency,. ....

Averages:
10 Perfect.
8 Excellent.
6 Good.
4 Fair.
2 Poor.

S. D. Hutchins.
Instructor.

Each man who receives instruction is rated, the highest rating being 10, which, Mr. Hutchins tells us, has never been attained by any man. Every employee is required to get a rating of seven at least.

Beginning at half-past eight in the morning there is a lecture and demonstration for, let us say, engineers. Men who have been selected to attend this lecture are present in the car, and a lecturer explains all of the mechanism and its operation. This lasts for an hour-and-a-half. This class then moves into a coach, where another man takes it and examines it for two hours. He goes thoroughly over the ground covered by the morning lecture, questioning the men to ascertain how much they have learned and to correct any misapprehensions that they may have carried away. The result of this quiz gives to each man a rating for the time, that is entered on the record blank in the office of the instructor. Each of these men at a subsequent lecture and quiz may be raised to a higher rating, and it sometimes happens that a man loses rank at his second lecture. This process of lectures and examinations is continued until the men have reached a satisfactory rating, or until it is no longer practicable for them to attend the lectures.

When the one class leaves the instruction car another class enters and is lectured for an hour-and-a-half, and then passes to another car for examination. In this way three or four lectures and as many examinations are held every day, which keeps the staff of the car pretty busy. Ordinarily, there are two employees of the Westinghouse Company with the car, and they are helped in demonstrations and examinations by men detailed from the railroad on

which they are at work. In this way 80, or 100 or 125 men are handled in a day. The men detailed from the railroad to help in the car are carefully selected and are assigned to the car during its stay on the road, which may be three months or one year. After this experience these men are, as a rule, used to carry on for the railroad company the work begun on the car.

By the help of sections of apparatus the men are instructed in the details of the mechanism of pumps, the engineer's valve, the triple valve, the brake cylinders, the air signal apparatus and all the parts of the air equipment. They are taught the use and care of all these; they are taught how to handle the engineer's valve in emergency and in service stops, and why it should be handled as they are taught to handle it. They learn not only how they can make a smooth and accurate station stop, but why by certain manipulation they can do this. They are taught also the art of handling the air whistle signal, which in itself is not so simple a matter as the man who never has tried it may think. They are taught that if the pulls on the whistle cord are not properly spaced the blasts in the cab will run together and the signal will have no meaning, or wrong meaning; and the reason why these things happen is made clear. In fact, the most minute details of operation are gone into.

The direct work of this car has been done in the education of the great number of men who have passed through its lecture courses, but beyond that it has done a very important indirect work in that it has been the model for a number of instruction cars built and equipped by individual railroads for the education of their own employes. We would advise any operating railroad officer who has the opportunity to do so to visit this car during the lecture hours, and see for himself the admirable and thorough method of training the men for the use of the air brake and the air signal. He will then realize that the business of a great brake company is not confined to the mere manufacture and sale of the apparatus.

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This instruction car is very completely equipped. Steam is supplied by a Westinghouse 12 h. p. boiler carrying 130 lbs. pressure, which is equipped with a Worthington pump, size 3x2x3 ins., and a Nathan No. 2 injector. A water tank is provided with a capacity of 800 gallons and coal storage for 1½ tons of anthracite. It often happens, however, that steam can be taken from the plant at the station where the car may be at work. The power consists of a 5 h. p. Westinghouse engine and dynamo, and there is a storage battery of 28 cells which serves to keep the lights going when the dynamo is not running. The car is lighted with 27 incandescent lamps, 16 c. p., 50 volts. Air pressure is provided by two Westinghouse pumps, an 8 in. and a 9½ in., and these pumps are shown in section as well. The main reservoir has a capacity of 30,000 cu. in. There is a complete brake equipment for a 30-car train. This includes the full number of feet of 1¼ in. pipe, also hose connections, angle cocks and cut-out cocks, triple valves, auxiliary reservoirs and brake cylinders. Air pressure gages are connected to the cylinders and auxiliaries, and convenient means are provided for cutting in any required number of cars. There are also an 8-in. and a 10-in. brake cylinder, with stirrups on the pistons to demonstrate the results of variation in piston travel and for other experiments. Sectional models are provided of brake valves, triple valves, cylinders, and, in fact, of all the equipment which can best be shown in this way. There is also a complete air whistle signal apparatus for a 15-car train, with the full amount of piping and all the connections. It will be seen that the equipment of this car gives a means for very clearly demonstrating the mechanical construction and the working of all the apparatus.

## NEW PUBLICATIONS.

A Table of Legal Weights per Bushel. A. L. Fraser, publisher, Yonkers, N. Y.

Mr. A. L. Fraser, of the General Freight Department of the New York Central & Hudson River Railroad, has compiled and published, in convenient form for the pocket or desk, this little table of legal weights. He has aimed to give the weights in pounds per bushel of agricultural and mineral products, etc., as provided for by the statutes of the various states and territories of the United States and of the Dominion of Canada. The tables cover about 100 articles, and some pretty important variations in the statutory regulations will be discovered in them.

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In Cassier's Magazine for January appear two articles of particular interest. The first of these, in order of publication, is "Engine Room Experience in War Times," by Passed Assistant Engineer F. M. Bennett, U. S. N., who served in the "New York" during the campaign. It is a remarkably well written account of the maintenance and management of a ship's engines in war times. Few people can have any notion of the number of things that must be constantly done to keep the machinery in working order. The flagship carried 60 extra mechanics, enlisted for the war, and her engineering force was over 200 men. The machine shop on the "New York" was run 24 hours a day, in three shifts, whenever there was work on hand, and it kept not only the New York but many of the small craft in service, repairing not only the engines and machinery but the ordnance material. "Our machine shop usually had work enough on hand to delight the heart of the owner of a jobbing shop." The Spaniards "had despised the mechanical arts and sciences, and by those arts and sciences they fell."

The other article of which we spoke is "American Locomotive Repair Shops," by Mr. William Forsyth, Superintendent of Motive Power of the Northern Pacific. Mr. Forsyth gives ground plans of nine existing shops, and of one designed by him, but not built. He analyzes and compares these, having regard to their probable economy and efficiency. One of these is the famous Horwich shops of the Lancashire and Yorkshire. He estimates the proper capacity of a shop as 8 per cent. of the locomotive equipment to be cared for. Thus "for 300 engines, the erecting shop should have a capacity for 24 engines." He gives in a table the sizes of the erecting, machine, boiler and smith shops of five important establishments. The article is well illustrated.

### A Pneumatic Flue Roller.

The Standard Pneumatic Tool Co., Chicago, has just brought out the reversible pneumatic flue roller, No. 7, shown by the accompanying engraving, to which has been given the trade name of the "little giant." The motor is of piston type, weighs 14 lbs. and uses about 10 cu. ft. of free air per minute. The speed and direction of running are controlled by means of the handle, which is also used to support the tool. Turning the handle to the right or left works a three-way cock, which governs the direction in which the motor runs, and when the handle is placed in the middle position the air supply is cut off, stopping the machine; the reversing can take place at full speed. This controlling feature is particularly adapted for flue rolling, and five 2-in. flues per minute is stated to be the rate of working. The same motor with a different tool is also used for cutting flues. Because of the small size of the machine, it can be used close to a corner, so that all the flues in a locomotive boiler can be reached.

## TECHNICAL.

### Manufacturing and Business.

We are informed by the manager of the Chicago Pneumatic Tool Company that the business of that company for December, 1898, was four times as great as for December, 1897. The increase during the year was rapid and went on from month to month, and '99 opens with a promise of still further increase. The new hand riveters for shipbuilders, bridge and structural work have proved to be a greater success than was anticipated. Mr. Duntley, now in Europe, reports excellent prospects for doubling the business there next year.

Mr. Ira G. Hedrick, Asso. M. Am. Soc. C. E., who has been in the employ of Mr. J. A. L. Waddell for about six years and has for some time been Principal Assistant Engineer in charge of the Kansas City office, has become a partner in the business. The firm name will be Waddell & Hedrick. It is not expected that the business will change particularly in character from what it has been heretofore, although the firm will expect to take up some work in designing and superintending the construction of electric railroads and railroad terminals.

E. G. Fisher, formerly connected with the McMullen Woven Wire Fence Co., has been appointed Eastern Manager of the Railway Department of the American Steel & Wire Co., the headquarters of which company are in Chicago.

The New York City offices of the Baldwin Locomotive Works and the Standard Steel Works have been moved to the Empire Building, 71 Broadway.

W. Dewees Wood, President of the W. Dewees Wood Co. of Pittsburgh, died at his home in that city, Jan. 2.

The name of the Lackawanna Lubricating Co. has been changed to the Lackawanna Lubricator & Mfg. Co. The company makes lubricators, grease cups, brass, copper and bronze castings, and "Lackawanna" lubricating compound.

John K. Lencke, who is connected with Q & C Co. of Chicago, sailed on the steamship "Majestic" January 11 for a trip through England, Germany, Russia, Sweden and Denmark, in connection with devices made by that company.

Clement F. Street has resigned the position of manager of the Railway Review to accept that of manager of the Railway Department of the Dayton Malleable Iron Co. of Dayton, O.

The Rheinbaubureau, Rorschach, Switzerland, is offering for sale a dredger of special construction. The warranted delivery is 75 cubic meters, or nearly 100 cubic yards, of material an hour. It was built by The Ship & Machine Building Co. of Mannheim. It is now in operation at the St. Gall Valley of the Rhine, where it will finish its present contract in three or four months.

The Pulaski Iron Co., 330 Walnut street, Philadelphia, wants a good second-hand narrow-gauge locomotive for use in ore mines in Virginia.

The opening of proposals for building wharves and excavating slips at the coaling station, Honolulu, H. I., advertised to take place at the Bureau of Equipment, Navy Department, Washington, D. C., Jan. 20, has been postponed until Feb. 1.

The McCord journal box and lid has been specified on 500 flat cars for the Northern Pacific, being built by the Barney & Smith Car Co., on 700 box cars for the Chicago Great Western, being built by the Michigan-Peninsular Car Co., on 200 cars for the Chicago & West Michigan, on 1,450 cars for the Delaware & Hudson, and on 60 cars for the Brainerd & Northern Minnesota.

To provide for increases in the business of the Q & C Co., Chicago, two buildings have lately been added to the plant at Chicago Heights. The main building is two stories high, and 225 ft. long by 65 ft. wide, while the new buildings are each 200 ft. long by 65 ft. wide. Railroad tracks run into the works and furnish the best of facilities for shipping.

M. H. Perry, for several years General Manager of the Madison Car Works, at St. Louis, Mo., and more recently connected with the Union Pacific, Denver & Gulf, is now representing the American Brake Beam Co., of Chicago, with headquarters at 1023 Monadnock Block, Chicago.

### New Stations and Shops.

The new Union station of the Lake Shore & Michigan Southern, the Pittsburgh, Fort Wayne & Chicago and the Chicago, Rock Island & Pacific roads at Englewood, Ill., mentioned previously in this column, is practically completed and will be opened for use about Jan. 15. Through passengers and baggage will be transferred there, avoiding the transfers between stations in Chicago, which have caused much inconvenience to travelers. The use of the new station by passengers to and from the East and West will save the 40 minutes necessary to transfer in the city. The new station is built of brick, and has all conveniences.

Press dispatches from Quincy, Ill., report that the new passenger station of the Chicago, Burlington & Quincy at that point is now under roof, and that work on the interior is being pushed forward rapidly. The outer walls are of pressed brick, with stone trimmings. The station will be 300 ft. long, and the total estimated cost will be about $100,000. The new freight house is finished, but the passenger station will not be completed before next spring.

### A New Double Cylinder Surfacer.

A new cylinder surfacer has just been brought out by the Egan Company, 202 West Front street, Cincinnati, O. This machine is designed to do equally well heavy or light surfacing in hard wood or pine. The cast sections are cored, and the main frame has a broad base with heavy cross girts. There are six feed rolls, 8 in. in diameter, and each has parallel lifts, so as to give full bearing across the entire width of the surface of the material to be planed. The lower rolls are driven by a large expansion gearing, and the two upper rolls are separately driven and weighted. The feed is driven from the cylinder, making it always controlled by its cutting speed, increasing and diminishing according to the velocity of the cylinder. The bed rises and lowers on four large screws, which work in ball bearings. The lower cylinder, with its bearings, is mounted in a long dovetailed slide, which may be quickly drawn out at the side for sharpening and resetting the knives. These are some of the many desirable features of this new machine.

### The Cast Steel Gun.

We regret to have to record that last Wednesday Dr. Gatling's cast steel gun went to pieces on the Sandy Hook proving grounds. It burst in the fifteenth round under a firing pressure of 36,500 lbs. per sq. inch. On the preliminary tests, when three shots were fired, about three weeks ago, the maximum pressure was 37,000 lbs. This result was expected by most of the ordnance officers of the army. Dr. Gatling attributes the failure to the fact that the gun was kept three or four days too long in the annealing furnace. We have not learned whether or not Dr. Gatling will try again, but, naturally, such trials are pretty expensive. The gun which burst was an eight-inch rifle.

### Boiler Water.

The Master Mechanics' Association Committee has sent out a circular asking for information as to the best method of preventing trouble in boilers from water impurities. The questions are as to troubles experienced, specific methods taken to overcome them, cost of water purification, influence of purification on cost of washing boilers, mileage and life of flues, fireboxes and boilers, and instructions to enginemen and roundhouse men with regard to water

purifying. Replies should be sent to Mr. A. E. Manchester, Motive Power Department, C., M. & St. P. Ry., West Milwaukee, Wis.

**Self-Registering Torpedoes.**

The United States Submarine and Railroad Signal Co., of Cleveland, O., is receiving orders from many railroads for its patent torpedo. This torpedo, which is oblong, 1 in. x 2 in., has two small dabs of red paint on the under side, so that when it is exploded a red mark will be left on the rail, thus affording incontrovertible evidence as to the place where the torpedo was put down. The paint is held in two indentations made in the under side of the cap. While the torpedo is kept in stock the ears, bent over, prevent disturbance of the paint.

**High Carbon Steel Fence Wire.**

Some of the large makers of fencing materials are taking advantage of the higher elastic limit and higher tensile strength of high carbon steel wire, and are now recommending its use for fences, to the exclusion of ordinary steel and iron wire. The greater strength of the high carbon steel wire permits the fence posts to be put farther apart, and when the wire is well made, with tension curves and coiled cables, the effects of changes in temperature are not noticeable. That the strength of wire is greatly increased by increasing the proportion of carbon is shown by the following comparative results of recent tests made by the American Steel and Wire Co.:

| Size. | Breaking Strength, lbs | | Increase of Strength. Per cent. |
|---|---|---|---|
| | Common Bessemer Steel Wire Carbon 0.08 to 0.10 per cent. | High Carbon Steel Wire. Carbon 0.40 to 0.45 per cent. | |
| No. 7.... | 2,510 | 3,500 | 39.4 |
| " 9.... | 1,560 | 2,500 | 60.3 |
| " 10.... | 1,280 | 2,000 | 56.2 |
| " 11.... | 1,000 | 1,800 | 80.0 |

It will be noticed that No. 11 high carbon steel wire is considerably stronger than the No. 9 common wire.

**Locomotive Staybolts.**

The Master Mechanics' Association Committee has sent out a circular asking for information as to practice in the use of staybolts. Inasmuch as the circular covers 18 questions, some of them pretty long, we shall not reprint it. The committee is made up of Mr. T. A. Lawes, Mr. S. M. Vauclain and Mr. George F. Wilson.

## THE SCRAP HEAP.

**Notes.**

A recent examination of the records of the employees on the Nashville, Chattanooga & St. Louis disclosed the fact that there were in the service 43 men who had worked for the road more than 40 years each.

At Nashville, Tenn., on Jan. 4, the paint shop of the Nashville, Chattanooga & St. Louis was destroyed by fire, together with eight passenger cars, a pay car and the private car of the President of the road. The loss is estimated at $57,500.

A passenger train of the Mexican Central was stopped by robbers near Ciudad Juarez, Mex., on the night of Jan. 7, but the passengers and trainmen scared them off. It is said that the robbers were "four unknown Americans."

A statement has been recently circulated that the Kansas City, Pittsburg & Gulf has made a horizontal reduction in salaries of employees. We are informed that the statement is false, no reduction whatever having been made in salaries.

For an excursion which is to be sent to California on Feb. 9 the Pennsylvania Railroad has engaged from the Pullman Company the magnificent train of cars which was exhibited at the World's Fair in Chicago and subsequently at Atlanta, Nashville and Omaha.

On the night of Jan. 3 a westbound passenger train of the Kansas City, Ft. Scott & Memphis was stopped by robbers at Macomb, Mo., and the through safe in the express car was blown open with dynamite. The express car was wrecked. It is said that the robbers got $20,000.

On one day recently the Pennsylvania Railroad moved through Mifflin, Pa., on the main line, 85 miles east of Altoona, 6,255 freight cars, being the largest day's business on record. This includes the movement in both directions, and the number of trains is given as 102.

The New York Central is to build, for the use of the Young Men's Christian Association, at the Seventy-second street freight yard, New York City, a new building, to cost about $20,000. It will be 99 ft. by 40 ft. The rooms now used by the Association at that place are too small.

The Express Gazette reports that during the year 1898, 28 trains have been held up by robbers in the United States, and seven stages; five passengers and trainmen have been killed and four injured; five robbers have been killed and six others have been shot, but not fatally.

The engineman of the eastbound Lake Shore & Michigan Southern passenger train which left Chicago at 3 p. m. January 4 became insensible from an attack of heart disease when the train was nearing South Bend, Ind. The stop for the station was made by the fireman. The engineman died shortly after he was taken to his home in Elkhart.

Chicago papers report that the real estate in the "town" of Pullman will soon be sold at auction, under the decision of the Supreme Court of Illinois, requiring the Pullman Palace Car Company to dispose of such of its interests as are not provided for by its charter. There are 2,000 brick residences, a hotel, churches, schools, library and other public buildings. It appears that heretofore the real estate at Pullman has been entered on the Chicago assessors' books as "350 acres, with the improvements thereon."

**Fur Coats for Motormen.**

The Syracuse Rapid Transit Railway Company, operating the street railroads in Syracuse, N. Y., now provides motormen with fur coats, for use while on duty in cold weather. It is said that the motormen are satisfied to have these coats instead of having the front platform of the car inclosed or "vestibuled." The Syracuse Company has also made a slight increase in the pay of conductors and motormen during their first two years of service. A new man will receive 14 cents an hour for the first three months, 14½ cents for the next three, 15 for the next six and then 15½ and 16 for the next two half years. Thereafter he gets the regular rate of 16½ cents.

**New Electric Companies.**

The General Electric Co. of Minneapolis, with a paid in capital of $2,100,000, was filed with Secretary of State of New Jersey on Jan. 9. The certificate of incorporation covers every method of producing and distributing light, heat and power by electricity. The preferred stock carries a six per cent. cumulative dividend; dividends are payable semi-annually, beginning Aug. 1, 1899. The common and preferred have equal voting powers. A provision somewhat new to such charters is that the directors are subject to removal during their term of office.

The United Lighting & Heating Co. was incorporated on Jan. 6 at Trenton, N. J., with an authorized capital of $12,000,000. The incorporators are: Mr. John M. Devlin, of Gloucester City, and Messrs. F. H. MacMorris and Edward Hand, Jr., of Philadelphia.

The Electric Light, Heat & Power Co., which recently secured control of the electric lighting plants in the upper part of New York City, has practically closed negotiations with the Edison companies for control of the electric light interests in the lower part of the city.

**Watch Inspection on the Illinois Central.**

General Superintendent A. W. Sullivan, of the Illinois Central, has notified employees that the regulation of their watches by other than the regular inspectors is likely to defeat the purpose of the inspection provided for by the company, by interfering with the work and the records of the inspectors. The circular says: "As any standard watch purchased from an authorized inspector, which fails to run within a variation of thirty seconds a week, will be redeemed by the inspector, also by the manufacturer, without expense to the owner, there is no object to be gained in attempting to evade the inspection requirements. Any employee having a watch whose performance is inferior to the standard required, and who attempts by unauthorized regulation to impose upon the inspectors, practices a deception upon the management of the road. It is, therefore, required that hereafter conductors and other trainmen, engineers and firemen, shall not attempt to regulate their watches themselves, nor permit them to be regulated by any other person than the authorized inspectors. Failure to comply with these requirements will be considered sufficient cause for dismissal from the service."

**Passengers Carried on the South Side Elevated.**

The South Side Elevated, Chicago, carried 5,547,213 more passengers last year than in 1897. The total number for 1898 was 18,898,548, against 13,351,335 in 1897. This gives a daily average of 51,776 for 1898, which is 15,197 more than the average for 1897, and is the best average made since the World's Fair year, 1893. The traffic for December was 1,944,785 passengers, a daily average for the month of 62,735, which is the best monthly showing of the year, the gain over November, the next best month, being nearly 3,000 a day. Compared with December, 1897, a gain of 5,961 passengers a day, or about 10 per cent., is shown, although there were no attractions this year at the Coliseum, as in December, 1897, to add to the traffic.

**Oil-Burning Locomotives in the Arlberg Tunnel.**

The Engineer (London) gives in a recent issue some notes of a ride through the Arlberg Tunnel on a locomotive burning oil fuel. On that division of the Austrian State Railroads in which the tunnel is located the usual fuel is Bohemian black coal, which evaporates about four pounds of water per pound of fuel. The increase in the number of trains through the tunnel has made it absolutely necessary to diminish the amount of smoke thrown out by the engines. Experiments were made with coal and coke, coke alone, and coal with oil; but all the engines hauling trains through the tunnel are now equipped with Holden's oil burning apparatus, the same that has been used on the Great Eastern of England. The coal burning engines are detached at Landeck, 17 miles south of St. Anton, which is at the eastern mouth of the tunnel. The oil burning engine described in the Engineer is a compound, with four pairs of driving wheels coupled, and cylinders 19,625 in. and 31.5 in. diameter by 24.875 in. stroke. The engines have boilers of the Polonceau type, with two steam domes, which are connected with one another by a large pipe above the boiler. This arrangement assists in preventing priming on steep grades. The driving wheels are 4 ft. 3.5 in. diameter, and the steam pressure is 210 lbs. per sq. in. The engine, as shown in a half tone print from a photograph, has a massive appearance, the smoke stack standing 18 ft. above the rail. The train, of 14 cars, weighs about 180 tons. It has first and second class passenger cars, a dining car, and sleeping, baggage and mail cars; and these are of such miscellaneous sizes that the train looks like a Dakota boarding-car outfit. On the steep grades approaching the tunnel the engines are worked with about 60 per cent. cut off, and sand is freely used. The engineman has before him a speed recorder to guide him in descending the steep grades. The tunnel is 10.4 kilometers (6.5 miles) long, and has two tracks. At each kilometer there is a numbered oil lantern. For the first four kilometers the grade ascends at about 10 ft. per mile, after which it descends at about 80 ft. per mile to the west end. The highest point of the tunnel being near the middle, east winds have frequently been strong enough to keep a large volume of smoke in the tunnel long after it would have escaped had the tunnel been level. Two patrolmen are constantly on duty in the tunnel, and at regular intervals they communicate with the stations outside by telephone. Express trains require about 15 minutes in going through the tunnel.

The atmosphere of the tunnel is described as perfectly clear. The exhaust steam is soon condensed and there are no unpleasant fumes from the oil fires. Tests made by Innsbruck University show that the percentage of oxygen in the air is 19.9 per cent., as compared with 20.9 per cent. outside. When coal burners are used, the percentage of oxygen inside the tunnel drops to 18.2.

**The Autocrat of the Yenissei.**

Revenge is sweet. So thought the captain of a steamboat on the Yenissei River, which plies in connection with the Siberian Railroad. He had been fined by a justice of the peace on the river, and did not like it. On what was, perhaps, the last trip of the season, his boat approached a landing where a crowd of passengers were awaiting what would very likely be their last chance of reaching the railroad till next spring. Among them the captain saw the wife of the justice who fined him. Whereupon, he sent the passengers ticketed to that landing ashore in a small boat, and steamed haughtily by the landing, the assembled passengers (and the justice's wife) without stopping.

**Railroad Legislation, Passed and Proposed.**

The radical railroad law recently passed in Kansas was reported in the Railroad Gazette last week. Since that bill became a law, the Lower House of the Kansas Legislature has passed another bill making it the duty of railroads to "deal justly with their employees, refrain from arbitrary, oppressive or degrading conduct toward them," etc., and giving the new court authority to compel railroads to perform their public duties in spite of strikes. Both branches of the Legislature have passed a bill reducing the rates on telegrams of 10 words throughout the state of Kansas to 15 cents each; day press rates from ½ cent to ⅛ cent, and night press rates from ¼ cent to ⅛ cent. Telegraph companies are placed under the supervision of the new Court of Visitation. This bill has been signed by the Governor. Lawyers say that the act can be shown to be unconstitutional, because of contradictory provisions in it. The Legislature has passed the Express bill, which provides that the Court of Visitation shall have jurisdiction over the express companies. Legislatures have recently convened in several states. In Arkansas and in Indiana it is said that railroad commission laws are pretty sure to be passed. In Illinois a bill has been introduced to repeal the Allen street railroad law, under which an attempt was recently made in Chicago to grant franchises for terms of 50 years. In Minnesota there is a proposition to make the railroad commissioners elective. In New York a bill has been introduced placing express companies under the supervision of the State Railroad Commission. In North Carolina two bills have been introduced requiring railroads to furnish separate passenger cars for colored persons.

The Governor of Montana, in his message to the Legislature which has just been opened, recommends the establishment of a railroad commission. Gov. Pingree of Michigan recommends that railroad and other corporations be taxed under the general tax law instead of on their gross earnings. The Governor recommends the repeal of the special charters of the Michigan Central and the Detroit, Grand Haven & Milwaukee, and intimates that the state ought to ultimately purchase the railroads within its limits. Gov. Lind of Minnesota recommends an increase of the state tax on railroads in that state. The present rate is 3 per cent. on gross earnings, which, according to the Governor, is less than the average rate in Wisconsin, Iowa and Illinois.

**Abatement of Smoke on the Long Island.**

The Long Island Railroad is making rapid progress in preparing its locomotives to burn hard coal, so as to conform to the demands of the New York City Board of Health for the abolition of smoke. Sixteen engines are now burning hard coal, nine new anthracite engines have been ordered, and 19 engines are now being changed in the shops of the company.

**Serious Collision Near Bound Brook, N. J.**

On Monday last, about 1 p. m., near West Dunellen, N. J., on the Lehigh Valley, there was a butting collision of passenger trains, both of which were running at full speed, and the engines and one car were completely wrecked. Sixteen passengers were killed, or so badly injured that they died within a few hours, and 19 passengers and three trainmen were injured. The eastbound track of the road at this point was blocked by the wreck of a freight train, which had been derailed about 5 a. m. by a broken journal, and trains were being run in both directions on the westbound track. The colliding trains were No. 71 westbound and third No. 20, eastbound. The westbound train consisted of three cars, and had only four passengers, all of whom escaped serious injury. The eastbound carried an excursion from Pennsylvania towns bound for New York, and there were about 400 passengers aboard. The baggage car of No. 20 had been set out, on account of a hot journal, at some point west of Mauch Chunk, so that a car full of passengers was attached directly to the engine. When the collision occurred the tender of the engine penetrated about one-third the length of this foremost car, and several of the victims were instantly killed.

The officers of the road have not given out the facts concerning the cause of the collision, but it appears to have been a mistake in issuing or in delivering telegraphic orders.

**Transformers.**

Under the title, "Transformer, Design and Operation," the General Electric Co. issues in pamphlet form two papers, both treating of the subject of electrical transformers. One is written from the standpoint of the central station manager by Mr. W. F.

White, General Manager of the Omaha (Neb.) Electric Light, Heat & Power Co.; the other, by Prof. W. E. Goldsborough, deals with the question of transformer economy. The first of these papers, which was read before the American Institute of Electrical Engineers, is the record of long personal experience with the working of transformers under actual commercial conditions, showing the relation of the losses, incident to the use of many small transformers, to the earning capacity of the plant, and the economy resulting from the substitution of a few high efficiency transformers of large capacity. Mr. White gives examples of these economics reduced to dollars and cents. In his station a saving of $6,000 a year in the cost of coal alone was realized. Prof. Goldsborough's paper was read before the National Electric Light Association and treats of the economy of transformers of various designs. In it are given many arguments in favor of the use of high grade transformers and emphasizes the necessity of frequent tests as the only means of detecting leaks, losses and the general depreciation of transformers. To these papers the General Electric Company has added several maps, showing graphically the advantages of the substitution of a few large transformers for numerous small ones. The pamphlet will be sent free by the General Electric Co.

**A New Street Railroad Company for Havana.**

Articles of incorporation of the Havana Electric Ry. Co. were filed with the Secretary of State of New Jersey, Jan. 7. The company is capitalized at $5,000,000. The incorporators are W. P. S. Melvin, East Orange, N. J., and G. K. B. Wade and Herbert A. Howell, of New York.

The objects of the company, as set forth in the articles, are to manufacture, produce and sell electricity, gas and fuel, and to operate railroads, telephone lines, gas and electric-light plants, etc. It is understood that the company is formed for the specific purpose of securing the street railroads of the city of Havana.

**Chicago Street Railroads.**

At a meeting of the North Chicago Electric Company, in Chicago, Jan. 10, Mr. Chas. T. Yerkes recommended the formation of a new traction company, with a capital of from $10,000,000 to $15,000,000, to absorb nine suburban feeder lines of the North and West side railroads. These nine roads have a total capitalization and bonded debt of $21,961,000, and all are operated in the interest of the Yerkes roads. The Cicero & Proviso St. Ry., the Chicago & Jefferson Urban Transit Co., the Ogden St. RR. Co. and the Suburban RR. Co. are feeders to the West Chicago St. RR., while the North Chicago Electric Ry., the Chicago Northshore St. Ry., the Evanston Electric, the Chicago Electric Transit Co. and the North Side Electric Ry. Co. are North Chicago St. RR. feeders. The total mileage is about 160 miles.

**Superintendents on the Great Northern.**

General Superintendent F. E. Ward, of the Great Northern, has issued a circular requiring master mechanics, round house foremen, car foremen, and all employees of the mechanical department, to report directly to division superintendents. The division superintendents are to be held responsible for everything in connection with repairs of engines and cars on their respective divisions.

**Card Baggage Checks on the C., M. & St. P.**

Announcement was recently made that the Chicago, Milwaukee & St. Paul would abandon the use of brass checks for baggage carried between local stations. General Baggage Agent W. D. Carrick informs us that card checks for checking baggage to Chicago have been in use on that road for five years, and the decision to use such checks throughout the company's lines is the result of satisfactory experience with the Chicago checks. Card checks have now been supplied to the stations on one division and will be supplied to the other divisions soon. The Chicago card checks have a brass eyelet and are fastened to the trunk by a piece of stout twine, but the expense of the eyelet and of putting in the twine is considerable, and it has now been decided to use leather straps, the same as with brass checks; in fact, the brass check is retained, but its number is punched out, and it is called a "brass back." It still bears the name of the road, and, therefore, would help to identify the baggage in case the card should get torn off. The brass punched out of the checks on hand was of sufficient value to pay for obliterating the numbers and furnishing straps for the duplicate brass checks.

The card checks are issued in the order of their serial numbers, no check being used a second time. The station from, as well as the station to, is inserted with a pen or rubber stamp. When baggage has been delivered the duplicate card given up by the passenger is cancelled by a punch or by crossing out the number. If a passenger loses his check he is made to pay 50 cents, the same as when he loses a brass check.

The use of card checks on the Canadian Pacific, which was described in the Railroad Gazette of Dec. 10, 1897, has proved highly satisfactory to the officers of that road.

**Chicago Public Works in 1898.**

In Chicago during 1898 36.18 miles of streets and alleys were paved, 18.83 miles with cedar, 8.52 miles with asphalt, 6.52 miles with macadam, 0.62 miles with granite and 1.7 miles with brick. There are 3,946 miles of streets and alleys within the city limits, of which 1,248 miles are improved and 2,698 miles are unimproved. Estimates have been prepared for about 150 miles of new pavements to be laid during 1899.

The Bureau of Sewers spent during the year $1,140,000. Fifty-three miles of main sewers, varying in diameter from 9 in. to 20 ft., were built, and 14.1 miles of 6-in. house drains were laid. Plans were prepared for sewerage districts as follows: Addison avenue, from the river west, estimated cost, $68,000; Lawrence avenue, from the river west, estimated cost, $115,000; Ninety-fifth street system, including 28 miles of outfall brick sewers and a pumping station, estimated cost, $1,500,000.

In the effort to increase the water supply of the city, the machinery of the various pumping stations has been overhauled or rebuilt, more of this work having been done than in any previous year. The capacity of the Fourteenth street station was increased about 30,000,000 gals. by the installation of a new pumping engine, and three new boilers were also added, the improvements costing $83,775. The capacity of the Sixty-eighth street station was also increased by the addition of a new 14,000,000-gal. pumping engine. The total amount of water pumped by all stations in 1898 was 99,360,000,000 gals., against 93,040,314,000 gals. in 1896, but the cost of fuel for this work has decreased from $229,349 in 1896 to $207,000 in 1898.

**Watch Inspection on the Atchison.**

A rule went into effect on the Atchison, Topeka & Santa Fe Jan. 1, under which there will be a weekly check on all watches that come under the surveillance of the watch inspector. The monthly inspection will be done away with and a quarterly inspection substituted. The trainmen will still be required to sign the daily register. Watch record cards will be issued bearing the name, occupation and address of the owner of the watch, the name of the movement and the number. The reverse side of the card will have four lines, one for each week, and once a week some local inspector must note the condition of the watch relative to correctness. The number of seconds slow or fast will be noted, and if the watch is set or regulated by the inspector he will so state on the card. The card does not have to be presented to the same inspector each time. The cards must be sent to the trainmaster on the first of each month.

## LOCOMOTIVE BUILDING.

It is reported that the Denver & Rio Grande will order 10 locomotives.

The Southern Indiana has sent out specifications for three 10-wheel engines.

The Honolulu Sugar Co. has ordered one locomotive from the Baldwin Locomotive Works.

The Raritan River has ordered one 10-wheel locomotive from the Baldwin Locomotive Works.

It is stated that the Maine Central has ordered five locomotives from the Schenectady Locomotive Works.

The Southern Indiana is taking bids on three 10-wheel locomotives, as noted in our issue of Dec. 23.

The Fitchburg has ordered two locomotives from the Manchester Locomotive Works and eight from the Schenectady Locomotive Works.

The Cleveland, Cincinnati, Chicago & St. Louis has prepared plans and issued specifications for a sample consolidation locomotive to weigh about 180,000 lbs.

In our issue of Dec. 9 we stated that the Bangor & Aroostook was preparing specifications for locomotives. This company has now ordered three from the Manchester Locomotive Works.

The Baldwin Locomotive Works have orders for one consolidation engine for the New Mexico Ry. & Coal Co., and for one 6-wheel switching engine for the Cambria Steel Co., for February delivery.

The Baltimore & Ohio Southwestern has placed an order with the Baldwin Locomotive Works for 45 engines, five of which will be 10-wheel passenger and the balance consolidations. They will all be Vauclain compounds.

The Long Island has ordered six locomotives from the Brooks Locomotive Works. This is in addition to the order for three, noted some time ago and which have been delivered. This road is now rebuilding 19 engines.

Pullman's Palace Car Co. has ordered one 6-wheel switching locomotive from the Baldwin Locomotive Works. It will have 51-in. drivers, 18x24 in. cylinders, slope tank, and will weigh 100,000 lbs. in working order.

The Chicago & Northwestern has ordered five Class R 10-wheel freight engines from the Baldwin Locomotive Works, like those of the same class previously ordered, except that the cylinders will be 20x26. It is reported that this road has placed an additional order with the Schenectady Locomotive Works, but this has not been verified.

In our issue of Nov. 18 we stated that the St. Louis, Peoria & Northern was preparing specifications with the intention of ordering 30 locomotives in the next three months. Specifications for about 25 freight, passenger and switching engines are now in the President's hands, but it is uncertain when bids will be asked.

The Baldwin Locomotive Works are building four locomotives for the Braganca, a railroad in Brazil. They will be moguls, of 1 meter gage, with 15 in. x 18 in. cylinders, 42 in. driving wheels and 8-wheel tenders of 2,200 gals. capacity. They will be fitted with Westinghouse brakes, Standard steel tires, truck and tender wheels and U. S. metallic packing.

The Great Northern has placed an order with the Rogers Locomotive Co. for 35 locomotives, 10 of which will be 10-wheel passenger and the balance 12-wheel freight. The passenger engines will have cylinders 18x26 in.; drivers, 73 in. in diameter; cast steel driving wheels; and will have 97,000 lbs. on drivers, the total weight being 129,000 lbs. The boilers will be of the Belpaire type; working steam pressure, 210 lbs. The tender capacity for water will be 4,500 gals. They will have triple sight feed lubricators, 18 in. round case headlights, magnesia sectional boiler covering, Jerome metallic packing, No. 9 injectors and half elliptic springs. The freight engines will have cylinders 19x32; drivers 55 in. in diameter; cast steel driving wheels; and will weigh 182,000 lbs., with 152,000 lbs. on drivers. They will have Belpaire extended wagon-top type boilers, the working steam pressure being 210 lbs. The tender capacity for water will be 5,000 gals. They will have triple sight feed lubricators, 18 in. round case headlights, magnesia sectional boiler covering, Jerome metallic packing, No. 10 injectors and half elliptic springs.

In our issue of last week we stated that the Erie ordered 24 locomotives. The 15 ordered from the Richmond Locomotive & Machine Works and the five ordered from Rogers Locomotive Co. will be simple 10-wheelers, and the four ordered from the Baldwin Locomotive Works will be compound engines of the Atlantic type. The 10-wheelers will weigh 144,000 lbs., with 105,300 lbs. on drivers; will have cylinders 20 and 26 in.; drivers, 62 in. in diameter; working steam pressure, 180 lbs.; fireboxes, 8 ft. 11⅛ in. long and 40½ in. wide; tank capacity, for water, 6,000 gals.; coal capacity, 10 tons. They will have Westinghouse-American air brakes, steel axles, Gollmar bell ringers, Kewanee brake beams, Gould pilot and tender couplers, Kelly headlights, Ohio, Metropolitan and Monitor injectors, U. S. metallic piston rod and valve packings, Consolidated muffler safety valves, Leach double sanding devices, Detroit and Nathan sight feed lubricators, A. French springs; tires, Standard, Midvale or Latrobe, not specified; cast iron wheel centers, Graham draft rigging on back of tender. The Atlantic type engines will weigh 142,000 lbs., with 82,000 lbs. on drivers; will have cylinders 13 and 22 in. x 26 in.; drivers, 76 in. in diam., Wootten boilers, working steam pressure, 200 lbs.; fireboxes, 96 in. long x 96 in. wide; tank capacity, for water, 6,000 gals.; for coal, 10 tons. The special equipment will be the same as for the 10-wheelers, except that steel wheel centers and Monitor injectors will be used.

## CAR BUILDING.

It is reported that the Ann Arbor is in the market for 100 flat cars.

The Union Pacific is taking bids on several hundred 40-ton coal cars.

The Chicago, Burlington & Quincy will at once order 1,600 30-ton box cars.

The Mexican International is having 100 freight cars built by the Barney & Smith Car Co.

It is reported that the Chicago, Rock Island & Pacific is in the market for 100 furniture cars.

The Chicago & West Michigan has ordered 100 refrigerator cars from the Wells & French Co.

The Barney & Smith Car Co. is building two passenger cars for the Georgia, Southern & Florida.

It is reported that the Buffalo, Rochester & Pittsburgh is in the market for a number of freight cars.

It is reported that the Mobile & Ohio will order several hundred freight cars, probably between 1,000 and 2,000.

The American Refrigerator Transit Co. has ordered 50 refrigerator cars from the Missouri Car & Foundry Co.

The Long Island is about to order 60 passenger cars, eight parlor cars and 20 combined smoking and baggage cars.

The Rio Grande Western has ordered the 100 stock cars mentioned in our issue of Dec. 30 from the Illinois Car & Equipment Co.

No definite official information is yet obtainable about the Kansas City, Pittsburgh & Gulf's large order for cars, previously mentioned in this column.

The Denver & Rio Grande will receive bids Jan. 16 for 500 30-ton box cars, 250 30-ton stock cars and 250 40-ton coal cars, the contracts to be let soon thereafter.

The Missouri Car & Foundry Co. has received an order from the Wabash for 500 30-ton box cars. It is understood that the road will also order 500 40-ton coal cars.

In our issue of Dec. 30 we stated that the Brainerd & Northern Minnesota was in the market for cars. This road has now ordered 60 flat cars from the Mount Vernon Car Mfg. Co.

We now understand that the Oregon Short Line order has not yet been let, but that the road has delivery date from the Schoen Pressed Steel Co. on 500 50-ton steel coal cars, and has asked bids on 250 box cars.

The Cincinnati, New Orleans & Texas Pacific is having 500 freight cars built, 400 by the Ohio Falls Car Mfg. Co. and 100 by the Lenoir Car Co. We mentioned in our issue of Dec. 9 that this road had asked bids on 500 cars.

It has been reported that the Chicago, Lake Shore & Eastern intended buying several hundred new freight cars, but we are informed by the President that the report is entirely premature, as it has not been decided to buy any cars this year.

The cars for the Delaware & Hudson, mentioned in our issue of Dec. 23, have been ordered as follows: Five hundred 40-ton hopper bottom coal cars each from Jackson & Woodin Mfg. Co., and Murray, Dougal & Co.; 450 30-ton box cars from the Union Car Co.

The Central Railroad of New Jersey will soon be in the market for 19 passenger coaches. The 2,500 hopper bottom 40-ton coal cars for this company, mentioned in our issues of Dec. 16 and Jan. 6, have been ordered, 500 each from the Illinois Car & Equipment Co., Jackson & Woodin Mfg. Co., Michigan-Peninsular Car Co., Union Car Co., and Murray, Dougal & Co.

We are officially informed that the Ottawa, Arnprior & Parry Sound (Canada Atlantic Line) will build 1,000 box cars at the rate of 150 per month. These cars will be of 60,000 lbs. capacity, will weigh about 32,000 lbs. and will be 34 ft. 6 in. long inside. They will have Westinghouse air brakes, Trojan couplers and metal bolsters. We noted last week that this road would build 500 cars.

The Iola Rapid Transit & Electric Light Co., Iola, Kan., will need new cars. (See Electric Railroad Construction column.)

It is reported that the Oakland Transit Co., Oakland, Cal., will need new cars. (See Electric Railroad Construction column.)

It is reported that the Wyandotte & Detroit River, Wyandotte, Mich., will want new cars. (See Electric Railroad News column.)

It is reported that the Columbia Railway Co. of Washington, D. C., will soon need new cars. (See Electric Railroad News Column.)

The Third Avenue Railroad, of New York City, has ordered 100 combination cars from the St. Louis Car Co. We stated in our issue of Dec. 9 that this road had asked several builders to prepare specifications and bids.

## BRIDGE BUILDING

ALEXANDRIA, LA.—Congressman Henry W. Ogden, of Louisiana, introduced in the House of Representatives on Jan. 4 a bill authorizing the Gulf, Louisiana & Great Northern Ry. to build a bridge across Red River at Alexandria, La. Last April a company was formed to build a bridge at this point. F. M. Welch and G. O. Watts were reported as interested.

ANTRIM, ONT.—A. Murphy is receiving tenders for the building of a new steel bridge across the Cam River.

BOONEVILLE, MO.—Congressman Bland, of Missouri, introduced in the House of Representatives Jan. 7 a bill to amend the act authorizing the building of the bridge across the Missouri River at or near the city of Booneville. The amendment allows three years from the date of the passage of the act for work to be begun and six years for the completion. This bridge was described in this column Jan. 4, 1898 (p. 48). A. J. Tullock, proprietor of the Missouri Valley Bridge & Iron Works, is interested.

BOSTON, MASS.—Proposals are wanted for building abutments of a bridge on Boston street over the New York, New Haven & Hartford RR. by Jan. 16. Wm. Jackson, City Engineer.

BUFFALO, N. Y.—The report of the Grade Crossing Commission states that six structures were finished during 1898, and the only structures actually begun in 1898 are the viaducts in Seneca street and in Hamburg street, over the tracks of the N. Y. C. & H. R., the W. S., the W., N. Y. & P., and the L. S. & M. S. The proposed work for 1899 is as follows:

1. A viaduct in Elk street and Abbott road over the tracks of the L. S. & M. S. and the Erie.
2. A viaduct in Abbott road over the tracks of the W. N. Y. & P., the N. Y., C. & St. L. and the Buffalo Creek railroads.
5. A subway in South Division street under the tracks of the Erie.
4. A subway in Abbott road under the tracks of the D., L. & W.
5. A subway in South Division street under the tracks of the N. Y. C. & H. R., the W. S., and the W. N. Y. & P.

The estimated cost, to the city, of all the work contemplated for 1899 is $221,375, and to the railroads, $569,605. Edward B. Guthrie, Engineer of the Grade Crossing Commission, 436 Ellicott square, Buffalo.

Sealed proposals are wanted by City Clerk Frank W. Gethoefer for the widening, straightening, enlarging and deepening and building the necessary bridges, paving approaches and dredging of the Buffalo River between Hamburg St. and the easterly city line, and also of the Cazenovia Creek.

BRIDGEPORT, PA.—A resolution has been passed ordering an overhead bridge over the Philadelphia & Reading tracks. No place has yet been decided upon for the bridge. A communication has been received by the city authorities from the railroad company, agreeing to build a bridge if the city pays the damages.

CHATHAM, ONT.—Tenders are asked by the County Council of Kent for the building of a through pin-connected steel truss bridge of 220 ft. span over the Thames River, at the site of the Moravian bridge. Plans can be had from W. S. McGeorge, County Engineer.

CHICAGO, ILL.—The differences between the Sanitary District Trustees and the railroads in regard to the building of the Chicago & Western Indiana bridge on section L were settled Jan. 4. Under the terms of the agreement the sanitary district is to build and maintain the bridge and the railroad company is to waive all claims for damages resulting through delay to their business. The bridge will cost about $150,000. Bids will be advertised for at once.

CLAYTON, MO.—County Surveyor Edgar Rapp, according to his report, recently submitted to the County Court, recommends six new steel bridges in St. Louis county. Several estimates have already been secured on the work, the lowest of which is $1,960.

DAVENPORT, IA.—The Chicago, Rock Island & Pacific is to build a steel bridge across Division St., the work to be completed by Sept. 30.

EL PASO, TEX.—The Mexican Central and the Atchison, Topeka & Santa Fe are jointly building a new steel bridge across the Rio Grande at El Paso, Tex. The American Bridge Works of Chicago has the contract. The bridge is to be of four spans, of which the A., T. & S. F. owns two, and the M. C. owns two. Each span is 105 ft. 6 in. over all. Notice was recently served on these companies to stop work on the bridge because of a disagreement between the American and Mexican engineers, the Mexicans claiming that the bridge obstructed the channel of the river. The Rio Grande, at this point, is a very small stream, under ordinary circumstances, and is often quite dry and very troublesome during high water. The cost of the entire work will be about $75,000.

GRAND RAPIDS, MICH.—The City Council has decided to build a steel bridge at Bridge St.

HARRISBURG, PA.—The subway, which is to be built on Market street, under the Philadelphia & Reading RR., is to be 14 ft. 6 in. in clearance. The bill which permits this work also authorizes the city to enter into contract with the Pennsylvania Canal Co. to build and operate a drawbridge over the canal on Market street. The work must be completed within six months. Chas. A. Miller, City Clerk. (Nov. 25, p. 850.)

HELENA, MONT.—Bids will be received until Feb. 2 for building an all-steel bridge across the south fork of the Dearborn River, about 12 miles northwest from Wolf Creek station. Length of span, 75 ft.; capacity for floor, 80 lbs. per sq. ft. dead weight. Roadway to be 16 ft. in the clear. Charles J. Clark, Clerk, Helena.

JOLIET, ILL.—Plans have been prepared by the Sanitary District Trustees for the changing of the dock at Jackson, and for raising of bridges over the canal on Sections 17 and 18. The work will cost $125,000.

LORAIN, O.—A bridge is to be built at Erie avenue, but it has not been decided if it shall be a lift or a swing bridge.

NEW YORK, N. Y.—The Board of Aldermen on Jan. 11 passed a resolution authorizing the issue of $100,000 in bonds for preliminary work on two proposed bridges over the East River.

OLYMPIA, WASH.—The U. S. Senate on Jan. 4 amended the act authorizing the Oregon & Washington Bridge Co. to build a bridge across the Columbia River between the states of Oregon and Washington, which extends and revives the act approved March 24, 1892. The bridge must be completed within three years from the date of the approval of the act. This bill also passed the House.

OMAHA, NEB.—According to report the Union Pacific is shipping material for replacing bridges between Rawlings and Evanston, Wyo.

PEORIA, ILL.—The St. Louis, Peoria, & Northern has begun soundings for the foundations for the bridge to span the Illinois River at Peoria. The company's general office is in St. Louis, Mo.

PITTSBURGH, PA.—Director of Public Works E. N. Bigelow reports that the 10th St. bridge should be replaced by a new structure. As prepared, the plans for the bridge estimate the cost at $260,000. He is about to submit them to the War Department.

POMONA, MO.—Senator Jones of Arkansas introduced in the United States Senate Jan. 6 a bill to authorize the St. Louis, Siloam & Southern to build a bridge across the White River in Arkansas. Another bridge will be necessary for the company to complete its contemplated line. It will be at Fort Smith, crossing the Arkansas River. Col. H. D. Mackey, Pomona, Mo., is President.

ST. PAUL, MINN.—Bids are wanted, Jan. 17, for the rebuilding of the Sixth St. viaduct, which was recently damaged by a train running into it. It was recently estimated that $15,000 would be necessary for the repairing of the bridge. Matt Jensen, City Clerk. (Dec. 30, p. 936.)

SALT LAKE CITY, UTAH.—On Dec. 29 the County Commissioners rejected all bids for the new bridge across Webber River, and have ordered new bids to be asked for.

SANTA MONICA, CAL.—A bridge is to be built on Ocean Ave., south of Railroad Ave. An election will soon be held to decide whether bonds should be issued to cover the cost of the work.

SHEFFIELD, TENN.—The House of Representatives has passed the bill authorizing the building of a railroad bridge across the Tennessee River at Sheffield, Colby County, by the Tennessee Bridge & Ferry Company. The structure is to be a drawbridge, and the act is void if the work is not begun in one year and completed within three years.

SHELBYVILLE, IND.—The County Commissioners recently let contracts for six bridges in different parts of the county without advertising for bids. Steps are now being taken to have the contracts declared void and advertise for bids for the work. The estimated cost for the six bridges is over $100,000.

SPRING LAKE, N. J.—The County Freeholders at Freehold, N. J., will soon ask for bids for building a steel bridge over Wreck Pond, Spring Lake, for which $14,000 has been appropriated. W. F. Lefferson, Chairman of the County Commissioners.

WASHINGTON, D. C.—The plans of the bridge for the Columbia St. RR., across the East Branch at Bennington, have been approved. The bridge is to be of steel, and is to be placed on District property parallel to the present bridge.

WINGHAM, ONT.—Tenders are being received by John Ansley, County Commissioner (County of Huron), for erecting the superstructure of a steel bridge over a branch of the Maitland River, about four miles from the town of Clinton, on the Grand Trunk Ry., to be 100 ft. long, of seven panels, 23 ft. from bed of stream to floor, 16 ft. roadway, with large safety factor.

## MEETINGS AND ANNOUNCEMENTS.

**Dividends.**

Atlanta & West Point.—Semi-annual, 3 per cent.
Central RR. of New Jersey.—One per cent., payable Feb. 1.
Chattanooga, Rome & Southern.—Preferred, 3 per cent., payable Jan. 17.
Delaware & Hudson Canal Co.—Annual, 5 per cent.
St. Joseph & Grand Island.—Preferred, 2 per cent., payable Jan. 31.

Cleveland City Ry. Co.—Three-fifths of one per cent.
South Bethlehem & Hellertown St. Ry. Co.—Quarterly, 1¼ per cent.

**Illinois Society of Engineers and Surveyors.**

The fourteenth annual meeting of this Society will be held at the University of Illinois, Champaign, Ill., Jan. 25-27.

**New York Railroad Club.**

The next regular meeting will be held in the rooms of the American Society of Mechanical Engineers, 12 West 31st street, Manhattan, at 8 o'clock p. m., Thursday, Jan. 19, 1899. Mr. Charles Hansel will read a paper (illustrated by lantern slides) upon the subject of railway signaling.

**Civil Engineers' Society of St. Paul.**

The sixteenth annual meeting of the Civil Engineers' Society of St. Paul was held at 8:15 p. m., Jan. 2. A communication was read from the Secretary of the Association of Engineers of Virginia announcing formal disbanding of association. The officers of the Society were re-elected, and Mr. Geo. L. Wilson was elected representative on the Board of Managers of the Association of Engineers' Societies.

**St. Louis Railway Club.**

A regular meeting of the St. Louis Railway Club was held in the parlors of the Southern Hotel, Jan. 13. A paper was presented by G. R. Blanchard, of New York City, entitled, "Railway Pools, Their Equity and Public Value."

Discussion.—"The Organization of a Railroad Engineering Department," by Willard Beahan; "The Performance of a Four Cylinder Locomotive," by Prof. R. A. Smart.

**The Engineers' Club.**

The annual meeting of the Engineers' Club, New York, will be held at the club house, 374 Fifth avenue, on Tuesday evening, Jan. 17, 1899, at 8 o'clock.

**The following** are the regular nominations of candidates to fill the places of the trustees whose terms expire Jan. 17, 1899:

To serve until annual meeting, 1902, H. S. Haines.

To serve until annual meeting, 1903: A. C. Rand, A. G. Mills, John Thomson, Charles Wallace Hunt and L. L. Buck.

**Central Railway Club.**

The next regular meeting of the Club, the annual meeting, will be held at the Hotel Iroquois, Buffalo, N. Y., on Friday, Jan. 13, 1899, at 10 a. m.

The trip to the Brooks Locomotive Works, which it was proposed to make immediately after the close of the business session, has been postponed.

The subjects scheduled for discussion are the reports presented at the November meeting by the committee on "Perfection of Top Hinged Oil Box Lids," and "Most Desirable Material for Driving Boxes."

**American Society of Civil Engineers.**

On Wednesday, Jan. 18, at 10 o'clock a. m., the forty-sixth annual meeting will be called to order in the auditorium of the house of the Society, 220 West 57th street. The annual reports will be read, officers elected and general business transacted.

At one o'clock lunch will be served in the lounging room, after which, if necessary, the meeting will be resumed.

For the afternoon the committee has arranged two short excursions:

(1) To the new East River Bridge, in charge of E. G. Freeman, M. Am. Soc. C. E., and Edwin Duryea, Jr., M. Am. Soc. C. E., Resident Engineers on the Manhattan and Brooklyn sides, respectively.

(2) To the docks, piers and bulkhead wall, in charge of Chandler Davis, Assoc. M. Am. Soc. C. E., Assistant Engineer, Department of Docks and Ferries.

The evening will be devoted to a social meeting, at the Society house, of the members, the ladies of their families and such other guests as they may invite. There will be informal dancing at 10 o'clock, and supper will be served during the evening.

Thursday, Jan. 19, will be devoted to an excursion by steamer, admission to which will be by ticket only.

The steamer Laura M. Starin will leave the pier of the Department of Docks, foot of West 57th street, at 10 o'clock, and will proceed down the Hudson River, calling at the pier of the Albany Day Line, foot of West 22d street, a few minutes later.

The steamer will then proceed down the river, through New York Bay and the Kill von Kull to Elizabethport, N. J., where, by invitation of Lewis Nixon, President, the works of the Crescent Shipyard will be inspected.

The return will be up the East River, passing under the Brooklyn Bridge. Lunch will be served on board at a convenient hour. A landing will be made at the Brooklyn Navy Yard. It is probable that the battleship Massachusetts will at this time be in Dry Dock No. 3, and the battleship Indiana, together with other vessels, be at the yard. A number of torpedo boats that have recently gone out of commission, have been hauled up on shore and may be seen to advantage. Facilities for the inspection of all points of interest will be afforded through the courtesy of Naval Constructor Francis T. Bowles, U. S. N., and Civil Engineer P. C. Asserson, U. S. N., M. Am. Soc. C. E.

At 8:30, at the society house, E. Wegman, M. Am. Soc. C. E., will deliver a lecture on "The Old Roman Aqueducts." The lecture will be illustrated with steropticon views. After this lecture there will be a "smoker."

For Friday an excursion to the new Croton Dam has been arranged through the courtesy of Messrs. Coleman, Breuchaud & Coleman, who will entertain such of the members and their guests as can arrange to go.

## PERSONAL

*(For other personal mention see Elections and Appointments.)*

—Mr. James D. Yeomans of Iowa has been reappointed an Interstate Commerce Commissioner by President McKinley.

—The formal announcement is made of the engagement of Mr. George W. Boyd, Assistant General Passenger Agent of the Pennsylvania Railroad, to Miss Noyes, of Washington. The wedding is to take place in Washington Jan. 24.

—Mr. W. R. Campbell, General Manager of the Dominion Atlantic, died in London, Eng., Jan. 9. Mr. Campbell was the Secretary of the company when it was first formed, 30 years ago, and for the past 10 years had been General Manager and Secretary, residing in London.

—Mr. W. L. Clark of the General Electric Co. has been appointed General Manager of the Foreign Department, succeeding Mr. D. Mazonot, who becomes Managing Director of the Mexican General Electric Co. in the City of Mexico. The Foreign Department will have charge of all commercial relations between the General Electric Co. and countries outside the United States. Mr. Clark has been for some time the Manager of the Railway Department of the General Electric Co.

—Among the nominations which the President sent to the Senate on Jan. 6 were the following promotions from Assistant Engineers to Passed Assistant Engineers, United States Navy: R. K. Crank, S. E. Moses, R. D. Hasbrouck, W. Bell, E. S. Kellogg and D. Van H. Allen. The following were promoted from Passed Assistant Engineers to Chief Engineers: J. L. Gow, G. E. Burd and Wm. McFarland. Chief Engineer McFarland has recently resigned from the navy to become Assistant Engineer of the Westinghouse Electric & Manufacturing Co.

## ELECTIONS AND APPOINTMENTS.

Atchison, Topeka & Santa Fe.—W. A. Bissell has been appointed Assistant Traffic Manager, with headquarters at San Francisco, Cal. He will have charge of the commercial interests on the Pacific Coast.

W. M. Smith, Commercial Agent at Pueblo, Colo., has been transferred to Trinidad, Colo., succeeding H. L. King, resigned.

Baltimore & Ohio Southwestern.—W. M. Green, who was chosen Vice-President in October last, succeeding Capt. W. W. Peabody, resigned Jan. 3. (Oct. 28, p. 785.) Under the receivership of Judge Harmon and Joseph Robinson, I. G. Rawn, heretofore General Manager, will assume the duties of General Superintendent. (Railroad News column.)

The jurisdiction of Superintendent W. H. Brimson of the Ohio Division has been extended over the Cincinnati terminals. Superintendent of Terminals Howard has resigned, and the position has been abolished. (Jan. 6, p. 14.)

Bellingham Bay & British Columbia.—A. Branin has been appointed Assistant Superintendent, with headquarters at New Whatcom, Wash.

Boyne City & Southeastern.—At a meeting of the Board of Directors, held in Boyne City, Mich., the following officers were elected: W. H. White, President; Thomas White, Vice-President; James A. White, Treasurer; A. D. White, Secretary, L. D. Fairchild, Auditor at Boyne City, has in addition to the duties of that office, assumed those of General Passenger and Freight Agent. H. J. White has been appointed General Superintendent, with headquarters at Boyne City, Mich.

Bridgeport & Helena.—The officers of this company, referred to in the Construction column are: President, W. Thomas Hart, Weiser, Idaho; Secretary and Treasurer, Wm. Miller, Ontario, Ore.; Chief Engineer, Eugene Schiller, Huntington, Ore.

Chattanooga, Rome & Southern.—Wm. Darby has resigned as Auditor. His headquarters were at Rome, Ga.

Chesapeake & Ohio.—W. S. Bronson has been appointed Assistant General Passenger Agent, with headquarters at Washington, D. C. He has been heretofore Chief Clerk in the Passenger Department at that point.

Chicago & Eastern Illinois.—E. H. DeGrott, Jr., has been promoted to Chief Train Dispatcher, succeeding J. C. Muir.

Chicago & Great Western.—David Van Alstine, heretofore Master Mechanic of the Louisville, Henderson & St. Louis at Cloverport, Ky., has been appointed an Assistant Master Mechanic at St. Paul, Minn.

Cincinnati, Hamilton & Dayton.—J. L. Stark has been appointed Foreman of Motive Power and Car Departments, and Superintendent of Docks at East Toledo, O., succeeding J. Stokes, resigned.

Cleveland, Cincinnati, Chicago & St. Louis.—The Michigan Division offices, heretofore located at Benton Harbor, Mich., have been moved to Indianapolis, Ind.

Colorado & Southern.—H. Van Mater has been appointed Manager of the coal properties of this line, with office at Denver, Colo.

T. E. Fisher has been appointed General Passenger Agent, with headquarters at Denver, Colo.

Cornwall & Lebanon.—B. D. Coleman, President, has resigned. He is succeeded by A. D. Smith, heretofore Superintendent of the road. At the annual meeting of the stockholders, J. H. Redsecker, C. Shenk and Andrew Brady, Directors, resigned, and the following were chosen to succeed them: Frank L. Grammer, Abram Hess and C. A. Bradbury.

Detroit, Toledo & Milwaukee.—J. P. Waldo has been appointed Trainmaster, with headquarters at Toledo. R. L. Gilmore succeeds Mr. Waldo as Chief Train Dispatcher at Toledo.

Erie.—E. V. Smith has been appointed Supervisor of Subdivision No. 3, with headquarters at Warren, O.

Grand Trunk.—W. J. Hunter has been appointed New York State Agent, with headquarters at 285 Main street, Buffalo, succeeding Chas. Clark, assigned to other duties. (Jan. 6, p. 15.) The office of Assistant Superintendent at Battle Creek, Mich., has been abolished. A. H. Lander, formerly Chief Train Dispatcher of the Eastern Division at Montreal, has been appointed Master of Transportation at Port Huron, Mich.

C. S. Cunningham, Trainmaster at Portland, Me., and lines east of Richmond, has been relieved of the duties of the position on the lines of the Second District west of Richmond, Que. He is succeeded by R. P. Dallion. A. W. Davis has been appointed Locomotive Foreman of the Grand Trunk and Wabash shops at St. Thomas, Ont., to succeed James Armitage, who goes to the Pamerston, Ont., Division.

Great Northern.—Leonard H. Young has been appointed Traveling Passenger Agent, with headquarters at Seattle, Wash.

Gulf & Interstate of Texas.—H. A. Johnson has been appointed Manager of the Freight and Passenger Traffic, with headquarters at Galveston, Tex.

Hannibal & St. Joseph (Burlington Route).—A. T. Perkins, Superintendent of Freight Terminals at St. Louis, Mo., has been appointed Superintendent of Terminals on the west side of the Mississippi at that point, in charge of freight and passenger matters. J. A. Somerville, heretofore General Agent at Hannibal, Mo., has been transferred to other duties at St. Louis, and is succeeded as General Agent by Howard Elting.

Kansas City, Fort Scott & Memphis.—J. W. Spencer has been appointed Superintendent of Bridges and Buildings.

Lake Shore & Michigan Southern.—H. R. Linn has been appointed Chief Draughtsman of the Car Department at Cleveland, O. O. Antz, heretofore General Foreman of the Cleveland Car shops, has been appointed General Foreman of the Buffalo shops. (Dec. 23, p. 923.)

Lehigh Valley.—At the annual meeting of the following subsidiary lines in Pennsylvania, held in Philadelphia Jan. 9, John B. Garrett was chosen Vice-President, succeeding Chas. Hartshorne, resigned; Schuylkill & Lehigh; Loyalsock, Easton & Northern, Montrose and Pennsylvania & New York Canal. (Dec. 30, p. 937.)

J. A. Droege, heretofore Trainmaster of the Southern at Asheville, N. C., has been appointed Assistant Trainmaster at Perth Amboy, succeeding D. A. Walter.

The position of Superintendent of Telegraph and Signals has been abolished. J. H. Jacoby has been appointed Superintendent of Telegraph, with office at South Bethlehem, Pa.

Louisville, Evansville & St. Louis.—Edward Worman has been appointed Master Mechanic of the shops at Princeton, Ind. Edward D. Seitz has been appointed Secretary and Purchasing Agent, with headquarters at Louisville, Ky.

Louisville, Henderson & St. Louis.—Master Mechanic David Van Alstine, at Cloverport, Ky., has resigned, to take effect Jan. 15.

Mobile & Birmingham.—T. E. Harwell, General Foreman at Mobile, has been appointed Master Mechanic, with headquarters at Mobile, Ala. Edward A. Niel, General Freight and Passenger Agent, with headquarters at Mobile, Ala., has resigned.

J. D. Clark, heretofore Superintendent, Purchasing Agent and Car Accountant, with headquarters at Mobile, Ala., has been appointed General Superintendent. The position of Superintendent has been abolished.

Frank C. Browder, Jr., heretofore Chief Clerk in the Louisville & Nashville offices in Montgomery, Ala., has been appointed General Freight and Passenger Agent, with headquarters at Selma, Ala., succeeding E. A. Neil, resigned.

Mobile & Ohio.—A. B. Wrenn, heretofore Traveling Passenger Agent of the Southern Pacific at New Orleans, has been appointed General Florida Passenger Agent for the M. & O., with headquarters at Jacksonville, Fla.

Northeast Pennsylvania (P. & R.).—B. H. Bail was elected a Director, filling the existing vacancy.

Northern Pacific.—R. C. Johnson has been appointed General New England Agent, with office at Boston, succeeding E. M. Newbegin, resigned. (Jan. 6, p. 14.)

North Pennsylvania (P. & R.).—At the annual meeting held at the Reading Terminal in Philadelphia Jan. 9, John H. Michener was elected President.

Ohio River.—John J. Archer, General Freight and Passenger Agent, with headquarters at Parkersburg, W. Va., has resigned. J. H. Hamilton, General Superintendent, will take charge of the duties of the office temporarily.

J. H. Hamilton, who has been Superintendent, with headquarters at Parkersburg, W. Va., has been made General Superintendent, with headquarters at the same place.

Oregon Short Line.—C. A. Boies, Division Superintendent of the Montana Division, with headquarters at Pocatello, Idaho, has resigned. He is succeeded by John McManis, with headquarters at the same point.

F. S. Deitrich has been appointed Assistant Attorney, succeeding Judge Blair. His headquarters are at Pocatello, Idaho.

Pacific Coast Company.—J. Donovan has been appointed General Roadmaster, with headquarters at Seattle, Wash.

Pacific Express.—At the annual meeting of the Directors, held in Omaha, Neb., Jan. 5, Horace G. Burt, President of the Union Pacific, was elected Vice-President, succeeding Oliver Mink, resigned.

Pecos & Northern Texas (Pecos Valley & Northeastern).—Don D. Donahue has been appointed Acting General Freight and Passenger Agent, with headquarters at Amarillo, Tex.

Philadelphia, Wilmington & Baltimore.—At the annual meeting of the stockholders held in Wilmington, Del., Jan. 9, the following new directors were elected: Frank Thomson, William Sellers, John P. Green, Benjamin B. Comegys, Benjamin F. Newcomer, Edward Lloyd, Skipwith Wilmer, E. Tatnall Warner, German H. Hunt, N. Parker Shorbridge, Preston Lea, William H. Barnes and Sutherland M. Prevost. The Directors organized as follows: Frank Thomson, President, succeeding B. F. Newcomer; John P. Green, Vice-President, succeeding Charles E. Pugh, who was elected Second Vice-President; S. M. Prevost, Third Vice-President; J. C. Sims, Secretary, and R. W. Smith, Treasurer.

Pittsburgh & Allegheny River.—James H. Park is President and Chas. E. Clapp is Secretary and Treasurer. The headquarters are at Pittsburgh, Pa. (See Construction column, Dec. 30, p. 938.)

Reading & Columbia (P. & R.).—At the annual meeting of this company, held in Philadelphia, Jan. 9, C. E. Henderson and W. N. Appel were elected Directors.

St. Louis & San Francisco.—H. L. King, heretofore Commercial Agent of the Atchison, Topeka & Santa Fe at Trinidad, Colo., has accepted a similar position with the St. L. & S. F., at St. Louis, Mo.

St. Louis Southwestern.—W. C. Watrous has been appointed Superintendent of Transportation in Texas, with headquarters at Tyler, Tex.

Sistersville, Pennsboro & Burnsville.—R. C. Venable has been appointed Engineer on the survey of this road, now being located. (Railroad Construction column, Dec. 30, p. 938.)

Southern.—E. A. Niel, heretofore connected with the Mobile & Birmingham, has been appointed Assistant General Freight Agent, with office in Washington, D. C.

Southern Pacific.—A. J. Ross has resigned as Foreman of Bridges and Buildings. His headquarters were at New Orleans, La.

Summerville, Blue Mountain & Walla Walla.—The officers and Directors of this company, referred to in the Construction column, are: President, P. J. Taylor; Vice-President, J. L. Story; Secretary, A. W. Rinehart; Treasurer, F. A. Paddock; General Superintendent, L. B. Rinehart. The central office is Union, Ore.

Toledo, St. Louis & Kansas City.—T. O. Morris, formerly Engineer Maintenance of Way on the Cleveland, Cincinnati, Chicago & St. Louis, has been appointed Chief Engineer of the T., S. L. & K. C., with headquarters at Frankfort, Ind.

Tyler Southeastern of Texas (St. Louis Southwestern).—At the annual meeting of the Directors, S. W. Fordyce, President and Director, resigned. Russell Harding, Vice-President and General Manager of the St. Louis Southwestern, was chosen as his successor. Edwin Gould, First Vice-President, also resigned. J. E. Edson, General Superintendent of the St. L. S. W., succeeds Mr. Gould.

Ulster & Delaware.—George I. Wilber of Oneonta, N. Y., has been elected a Director.

Union Pacific.—A portion of the Kansas Division between Cheyenne Wells, Col., and Denver, 177.2 miles, has been attached to the Colorado Division. It has been heretofore operated by Supt. Brinkerhoff. Henceforth Supt. Deuel will have charge of it.

The office of Master Mechanic on the Colorado Division has been abolished, and the shops have been placed in charge of J. H. Manning, Master Mechanic of the Wyoming Division. His headquarters are Cheyenne, Wyo. (Dec. 16, p. 903.)

Wabash.—General Foreman J. E. Mulfield of the St. Thomas, Ont., shops, has resigned, and F. F. Whitney will succeed him at St. Thomas.

White Pass & Yukon.—H. M. McCartney, General Freight and Passenger Agent at Skaguay, Alaska, has resigned, and C. O. Figgins has been appointed General Agent, with headquarters at the same point.

Wilmington & Northern (P. & R.).—The headquarters have been moved from Wilmington to the terminal station at Philadelphia, Pa. The officers recently chosen are: President, H. A. Dupont; First Vice-President, Theodore Voorhees; Second Vice-President, Chas. E. Henderson; Treasurer, W. A. Church; Comptroller, Daniel Jones; Superintendent, O. G. McCausland; Secretary, E. B. Shurter; Purchasing Agent, J. B. Landis.

B. Briggs, General Passenger and Freight Agent before absorption of the W. & N. by the Reading, has been appointed Division Freight Agent, with headquarters at Wilmington, Del.

## RAILROAD CONSTRUCTION,
### New Incorporations, Surveys, Etc.

ALABAMA ROADS.—Grading is to be completed this month on the Pioneer Mining & Manufacturing Co.'s line from Thomas, Ala., to the company's new coal fields at Sayreton, four miles. F. B. Keiser, of Thomas, Ala., is Superintendent. (New Roads, Nov. 18, p. 838.)

The Bear Creek Mill Co., of Manistee, Ala., will extend its logging road about 12 miles.

ALLEGHENY JUNCTION.—This connecting line in Pittsburgh, Pa., from the Allegheny Valley Ry. of the Pennsylvania to the Pittsburgh Junction RR. of the B. & O., one-fourth mile, has been completed. A. H. Keith is President, and J. W. Patterson, Chief Engineer, both of Pittsburgh. (Nov. 11, p. 820.)

ARBUCKLE & WOLF CREEK.—This company has been incorporated in West Virginia, with a capital stock of $100,000, to build a railroad in Fayette county, beginnng at or near the head waters of White Oak and Arbuckle creeks, and running thence through Wolf Creek Valley to the Great Kanawha River, and connecting with the proposed line of the Kanawha & New Orleans Coal & Transportation Co. at deep water on the Chesapeake & Ohio. The incorporators are: J. M. Richards, Annie L. Richards, Minerva Richards and Wm. Richards, of Oakhill, W. Va., and J. A. Franklin, of New Orleans, La.

ARKANSAS & CHOCTAW.—Surveys have been completed for the extension from Choctaw City, Ark., west 130 miles via Doaksville, I. T., Goodland and Atoka. Locating surveys have been made for 12 miles from Choctaw City and two miles of track laid in Indian Territory. W. H. Carson, Texarkana, Ark., Superintendent. (Nov. 18, p. 838.)

ARKANSAS CENTRAL.—This company, which went into the hands of a receiver as noted last week (p. 17), is making a connection at Fort Smith, Ark., with the tracks of the Missouri Pacific. It is reported that the M. P. is to use this line, which has been completed from Fort Smith to a point three miles beyond Charleston, as a portion of its southern extension from Little Rock. (M. P., Dec. 16, p. 904.)

Perris & Lake View Line.

ATCHISON, TOPEKA & SANTA FE.—The Perris & Lake View extension, just completed, runs from the Southern California line at Perris, Cal., northeast 8.05 miles, via Lloyd to Lake View. Grant Bros., of Los Angeles, had the contract for grading; but track laying, bridging, etc., was done by the company's own forces. The San Jacinto, Lakeview & Northern, partially graded from San Jacinto to Lakeview, has been abandoned.

L. W. Lewis of Topeka, Kan., is reported to have secured the contract for ballasting the track from Florence to Winfield, Kan., 73 miles.

ATLANTIC COAST LINE.—Thomas Wilson, of Camp Ridge, S. C., President of the Wilson & Summerton line of the A. C. L., is reported as saying that the road is to be extended from Sumter, S. C., north 31 miles to Camden.

BALTIMORE & OHIO.—Considerable work is being done on the Trans-Ohio divisions, with a view to using 70-ton locomotives on all portions of the line. Since July 9,290 tons of 75-pound and 12,943 tons of 85-pound rails have been laid on the Central Ohio, Lake Erie and Chicago divisions. About 17 miles of sidetracks has been laid, a freight depot built at Mansfield, O., an interlocking plant at Plymouth, O., and five water stations.

BELLINGHAM BAY & BRITISH COLUMBIA.—Locating surveys are reported completed for this proposed line from Everson, Wash., to run up the north fork of the Nooksack River to the Mt. Baker Min-

ing District, about 40 miles. J. J. Donovan, Superintendent, was in charge of the surveys. Albert S. Cole of New Whatcom, Wash., and P. B. Cornwall of San Francisco, are among those interested.

BIG THREE.—Congressman McRae, of Arkansas, on Jan. 5 introduced a bill authorizing this company to build and operate a branch line in the Indian and Oklahoma Territories, to begin at or near the west line of Little River county, Ark., and to run through the Choctaw, Chickasaw, Creek and Seminole Nations, I. T.; thence through Oklahoma City and Guthrie, O. T., to Sherman, Tex. This company was incorporated in Arkansas in 1897, with a capital stock of $3,000,000, to run from Lakeport, on the west bank of the Mississippi River, west via Hamburg, New London, Eldorado and Magnolia to Texarkana. D. C. Willet, of Morganfield, Ky., was at that time President. (Sept. 3, 1897; p. 627.)

The bill provides that passenger rates shall not exceed three cents a mile, and the right is reserved to Congress to regulate the rates for freight and passengers until state governments are established in the Territories. The railroad company is to pay to the Secretary of Interior, in addition to compensation for property taken, the sum of $50 per mile for the benefit of the Indian tribes.

BISMARCK & POTOMAC VALLEY.—This company, recently incorporated in West Virginia (Nov. 11, p. 820), is reported to have determined to build from Davis, W. Va., to Winchester and Harper's Ferry, about 80 miles, and surveys have recently been completed for a portion of the line. F. M. Leonard, Forest Building, Philadelphia, is attorney, and D. P. Herr, of Philadelphia, a director.

BRIDGEPORT & HELENA.—Surveys are completed for this line from Huntington Bridge, on the Oregon Short Line, between Oregon and Idaho, to run north 95 miles on the east side of Snake River to Helena, Idaho, in the Seven Devils copper regions. No contracts have as yet been let. The officers are given under Elections and Appointments. (Official.)

BRUTON & PINEORA.—The road of this company recently bought by the Central Georgia, has been extended east through Stillmore, Ga., Grimshaw and Metter, 47 miles, to the Fifty-fifth Mile Post, and is building to Register Still, Ga., three miles further. Grading was completed to Stillmore, 38 miles, in 1897, and track laid on that section early last year. (July 29, p. 555.)

CALGARY & EDMONTON.—A special meeting of the shareholders is called for Jan. 18 to authorize the Directors to give bonds for building the line. R. A. Smith, of Toronto, Ont., is Secretary.

CANADIAN PACIFIC.—The company proposes to begin surveying for a branch from Midway, B. C., on the Kettle River, near the international boundary, to run south and west, following the Okanogan Valley and running to the Lake Chelan region, in Washington.

CANADIAN ROADS.—Lewis & Smellie, solicitors, of Victoria, B. C., give notice of an application to the Parliament of Canada to incorporate a company to build a line from a point between Ashcroft and Kamloops, on the line of the C. P. R., in British Columbia, to run north to the Quesnelle Forks or other points on the Quesnelle River in the district of Cariboo, thence northwest, crossing the Fraser River, and along the telegraph trail to a point on the Necharcca River, thence northwest via Hazleton, at the forks of the Skeena River.

Messrs. Bradburn, Dumbleton & Innes, solicitors, of Victoria, B. C., give notice of an application for a company to build a line from Revelstoke, on the Columbia River, to run north along the Columbia and Canoe rivers to the fifty-third parallel of latitude.

CAPE FEAR & NORTHERN.—Grading is completed for 20 miles from Apex, N. C., to Williams, and track is laid from Apex to Blanchard's, 12 miles, on this proposed line from Raleigh, N. C., to Lillington. Gibson & Carpenter Bros. have the contract. J. C. Angier, of Holly Springs, N. C., is General Manager. (Aug. 5, p. 571.)

CEDAR RAPIDS, GARNER & NORTHWESTERN.—Track is laid from Hayfield, Ia., northwest 18 miles to Titonka. E. P. Boyanton, of Garner, Ia., is Chief Engineer. (Nov. 18, p. 838.)

CHATTANOOGA & LOOKOUT MOUNTAIN.—This company, according to report, will extend this line south 10 miles to Durham, Ga., to give the Durham Mining Co. an easier outlet for its produce. It will be built by J. T. Crass and associates, who recently bought the road at a court sale for $10,000.

CHICAGO & ALTON.—Steps are being taken by the City Council of Joliet, Ill., to compel this road to raise its tracks. A rough estimate of the cost to this line and the Chicago, Rock Island & Pacific and the Atchison, Topeka & Santa Fe, furnished by the City Engineer, is about $400,000 to each. The other roads affected are the Elgin, Joliet & Eastern and the Michigan Central. These roads have about two-thirds less mileage in the city limits than the others. The plan proposed is to elevate the tracks eight or nine feet and cut the street four feet.

CHICAGO GREAT WESTERN.—Surveys have been completed for the extension from Hampton, Ia., into Omaha, Neb. It is stated that the extension will be 170 miles long, and when completed will form the shortest route between St. Paul and Omaha. The Omaha Bridge & Terminal will supply the terminals at Omaha. Building is to be begun as soon as the English stockholders approve of the plan.

CHICAGO, MILWAUKEE & ST. PAUL.—Press reports state that an extension is to be made from Kimball, S. D., southwest about 20 miles to the Missouri River, and that the line will be extended from that point to the Black Hills westward.

CLEARFIELD SOUTHERN.—Track is laid from Porters, Pa., to Wood Island, 8½ miles, and grading is in progress on 8½ miles more to Belsena, on the Pennsylvania. A. W. Lee, of Clearfield, Pa., is President. (Nov. 18, p. 838.)

COLUMBUS, BLOOMINGTON & TERRE HAUTE.—Chas. W. Shaw, of Bloomington, Ind., General Superintendent and a director of this company, has asked the people of Columbus, Ind., for a franchise for terminal and depot facilities for his company in that city. A 2 per cent. tax aid will be asked in different townships through which the line passes from Columbus west about 85 miles via Bloomington to Terre Haute. The preliminary survey is to be made at once. Peter Willoughby, of Bloomington, is President. (Jan. 6, p. 15.)

DENISON, BONHAM & NEW ORLEANS.—Surveys are reported in progress in the vicinity of Wolfe City, Tex., on this proposed line from New Orleans, La., northwest through Shreveport, La., and Bonham, Tex., to Denison. The company was chartered in 1887, and grading completed from Denison to Bonham in 1888, but no rails were laid. (Apr. 1, p. 245.)

EL PASO & NORTHEASTERN.—C. B. Eddy, President and General Manager, is reported to have wired from New York to the contractors at El Paso, Tex., to begin grading at once on the extension of the main line from Laluz to Salida, N. M., 90 miles, and that the extension is to be completed by May 30. (Nov. 25, p. 852.)

FORT WORTH & RIO GRANDE.—J. L. Slayden, of San Antonio, Tex., has requested of the State Railroad Commission authority for this company to issue bonds to the amount of $20,000 per mile for a proposed extension from Brownwood, Tex., south about 175 miles to San Antonio.

GEORGIA ROADS.—The road of the Cherokee Iron Co., now building, will be nine miles long, extending from Lyerly, Ga., to the company's ore beds at Mill Creek. Grading is being done by the company. (Dec. 30, p. 938.)

GILA VALLEY, GLOBE & NORTHERN.—Grading is in progress on a branch two miles long from Globe, Ariz., to copper smelters.

GLADEVILLE.—An extension is proposed from Wise, Va., via Pound Gap and Pine Mountain to the head waters of the Kentucky River, hence along that river to Jackson, Ky., about 120 miles. Emil Low, of Saltville, Va., is Chief Engineer.

GREAT NORTHERN.—President Hill is reported to have stated that the improvements for Spokane, Wash., will amount to about $500,000. This includes a new depot, for which the plans are ready.

GULF & SHIP ISLAND.—Surveys are reported in progress for the proposed extension of this line from Hattiesburg, Miss. (Dec. 16, p. 903.)

HOLSTON VALLEY.—With regard to the proposed extension in Johnson county, Tenn., into timber lands, the General Manager writes that an extension has been solicited to give an outlet for certain timber lands, but no proposition has ever been made either by the railroad company or by the company owning the lands, and he cannot say at this time that anything will ever be done in that direction. (Dec. 30, p. 938.)

IAEGER & SOUTHERN.—The firm of Walton & Luck is reported to have obtained the contract for building the 4.6 miles from Iaeger, W. Va., to Cane Creek. The company was incorporated in West Virginia in January, 1898, to build a line from Iaeger to the mouth of Jacob's Fork, a tributary of Dry Fork of the Sandy River, about 35 miles. Wm. D. Janney, of Welsh, W. Va., is Chief Engineer. (Jan. 28, 1898; p. 70.)

ILLINOIS CENTRAL.—John F. Dunconde of Ft. Dodge, Ia., President of the Ft. Dodge & Omaha extension, is reported as saying that the rails are bought and contracts for ties let for the entire line, and that contracts for grading have been let for 61 miles. (Dec. 9, p. 885.)

INTERCOLONIAL.—A new wharf is being built at St. John, New Brunswick.

IOWA, MINNESOTA & NORTHWESTERN.—This company is reported surveying for a line from Blue Earth, Minn., southeast via Mason City, Ia., Dumont and Parkersburg to Belle Plaine. It connects two sections of the Chicago & Northwestern, which company is supposed to be back of the project.

KANSAS CITY, PITTSBURG & GULF.—Grading is reported completed on the Northern RR. cut-off from Trimble, Mo., north 10¼ miles to Gower. Track laying is to be begun at once and the line made ready, for traffic Feb. 1. (Nov. 11, p. 820.)

KETTLE RIVER VALLEY.—The bill granting right of way through the Colville Indian Reservation in Washington, which passed the Senate in December and was reported to the House on Dec. 15, has been returned to the Senate with a request to reconsider the vote. (Dec. 30, p. 938.)

KUSHEQUA.—Track is laid for seven miles from Kushequa, Pa., to McKean's, and the line is to be extended to Farmersville, eight miles more. Elisha K. Kane, of Kushequa, Pa., is President. (May 20, p. 367.)

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—Surveyors are reported at work for an extension of this line north into Fargo, N. D.

MISCELLANEOUS CORPORATIONS.—The Reno Union Bond Co. was incorporated in Kentucky Dec. 31, with a capital stock of $100,000, as a general construction company, to build railroads among other work. The incorporators are: Wm. G. Negley, Wm. T. Wallace, Edward M. Whipps and James K. Henderson, Pittsburgh, Pa., and Charles V. Culver, Reno, Pa.

MISSISSIPPI RIVER, HAMBURG & WESTERN.—Track is laid for 25 miles from Hamburg, Ark., to a point two miles east of Big Bayou, and it is expected that the line will be completed to Cone City, 46 miles, this year. It is proposed to continue the road to Texarkana, Ark., 135 miles from Hamburg. J. M. Parker, of Hamburg, Ark., is General Manager. (Nov. 18, p. 838.)

MISSISSIPPI ROADS.—H. Sidney King, Jr., of Meridian, Miss., is reported surveying for a line from a point on the Illinois Central to run south about 40 miles to Philadelphia in Neshoba county. It is understood that the line is to be eventually extended to Meridian.

NEW YORK, NEW HAVEN & HARTFORD.—This company will relay its New London Division between East Haven and New London, 45 miles, double track, with 100-lb. rail during the coming spring and summer. This will require 15,000 tons, already ordered. The balance of the division, between East Haven and the junction at New Haven, 4½ miles, double track, was laid with 100-lb. rail some time ago. (Official.)

NORTHERN PACIFIC.—The completed plans of the Washington Central extension show that the line is to be run from Coulee City, Wash., northwest to a point on the Columbia River near the mouth of the Okanogan River, thence across the Columbia and down its right bank to Wenatchee, on the Great Northern; thence south to the N. P.'s main line near Allensburg. The extension will be about 135 miles long, with a six-mile branch to Lake Chelan, and will shorten the N. P. 38 miles between Tacoma and Spokane, carrying the line 80 miles north of the Great Northern and making tributary the Okanogan, Methow, Republic and Chelan mining districts.

OHIO VALLEY.—This company was incorporated in Pennsylvania Jan. 7, with a capital stock of $125,000, to build a line 12½ miles long in Allegheny and Beaver counties from Coraopolis to Freedom. The Directors are: A. P. Kirtland (President), John C. Whitta, W. T. Wallace, L. S. Brock, H. F. Woodburn and W. P. Potter, Pittsburgh; J. J. Hoagleton, Allegheny, and A. P. Meyer, Sharpsburg.

OMAHA BRIDGE & TERMINAL.—The Omaha Council on Jan. 3 granted this company the franchise called for on the streets of that city. This closes the fight that has been in progress for some months and will give several railroads entry over the company's new bridge into that city. (Dec. 23, p. 924.)

OREGON RAILWAY & NAVIGATION.—The company is making rapid headway and acquiring right of way for its extension from Lewiston, Idaho, southwest to Camas Prairie. The line is to be extended through Lapwai and Cottonwood to Mount Idaho, about 50 miles. Surveys are already completed from Lewiston to Cottonwood, but the route between Cottonwood and Mount Idaho has not been determined.

According to report, surveyors have been at work east of Baker City, Ore., with the probable intention of running a line to the Seven Devils mining district.

The Snake River Valley, which was incorporated early last year as a company of the O. R. & N. to build from Lewiston west about 60 miles along the Snake River to Repiaria, Wash., on the O. R. & N., has filed supplementary articles of incorporation, increasing the capital stock and authorizing the building of nine branch lines in the Upper Columbia Valley, in Eastern Oregon and Washington, and Central Idaho. (S. R. V., March 25, 1898; p. 225.)

PENNSYLVANIA.—A curve between Johnstown and Portage, Pa., has been eliminated and the line shortened about a mile. Work has been in progress three years. Engineers are surveying a new route through Irwin, Pa., for straightening the track. It is reported the work will be begun shortly.

PENNSYLVANIA ROADS.—Three miles of track is reported laid on the line of Du Bois & Hoover from Glen Campbell, Pa., up the south branch of Cush Creek toward the company's timber tract on the Little Mahoning, six miles. It is expected that the road will be completed in February. (New Roads, Dec. 9, p. 885.)

PHILADELPHIA & READING.—The new cut-off, about 1½ miles, at Shippensburg, Pa., to connect the Reading line with the Western Maryland, is about completed and will be put in operation very soon. (Sept. 3, p. 697.)

PIKE'S PEAK TUNNEL MINING.—Contracts have have been let to the Pike's Peak Tunnel Construction Co., a subordinate corporation, for building a standard gage line from Cripple Creek, Col., via Victor, Cripple and Four Mile Creeks to Cañon City, about 30 miles. The work is to be completed in 120 days. T. J. Dalzell of Colorado Springs is Superintendent of Construction and George H. Proctor of New York City is a heavy owner of the line.

PITTSBURGH & LAKE ERIE.—It is reported that work will soon be begun in extending the sidings between Pittsburgh, Pa., and Youngstown, O., and building additional yards at those points. The improvements under way at Pittsburgh, Pa., include a new yard at South 34th street, and another at Braddock, having a capacity respectively of 1,000 and 1,500 cars. The yards at McKee's Rocks, Pa., are also being enlarged.

PITTSBURGH & WESTERN.—Men are grading for a second track to be laid between De Forest and Youngstown, O., 13.5 miles.

RIO GRANDE WESTERN.—For the coming yearly renewals 500,000 redwood ties will be used. They have already been contracted for.

SAGINAW SOUTHERN.—The Senate on Jan. 4 passed the House bill granting this company right of way through the San Francisco Mountains forest preserve. The line is to run from Williams, Ariz., south 36 miles to Jerome, and grading is reported in progress. J. C. Brown, of Williams, is President and General Manager. (Dec. 16, p. 904.)

ST. LOUIS & NORTHERN SHORT LINE.—The stockholders of this company, recently incorporated to absorb the St. Louis, Peoria & Northern, and to build the extension to Chicago (Jan. 6, p. 16), have authorized the company to take a lease of the old railroad now operating 164 miles from St. Louis north to Peoria, Ill. The extension northwest from Peoria has been definitely located to connect with the Chicago, Milwaukee & St. Paul and the Chicago & Northwestern at East Clinton, and with the Chicago, Rock Island & Pacific at Moline. Surveys are nearly completed for the Chicago & Northern connection, incorporated last week, p. 16, from Marine, Ill., south to connect with the St. Louis & Nashville at Sparta. Two parties are making surveys for the extension to Chicago, and proposals for equipping the new road are being considered. The new company has assumed the lease of the terminal facilities in Chicago made by the old company, and $264,000 has been paid on account of rental.

ST. LOUIS, IRON MOUNTAIN & SOUTHERN.—Surveyors are reported at work on the route from Piedmont, Mo., north 50 miles via Paterson to the St. Francois River to Bismarck. This would form a cut-off over the main line at a much easier grade.

SAN FRANCISCO & NORTH PACIFIC.—In a table of operating expenses, in the annual report, it is shown that $11,000 was expended in bridge repairs, and 479 tons of rail was laid in replacing the main track and siding.

SOUTHERN PACIFIC.—The San Diego (Cal.) Council has given permission to lay several miles of new switches along the water front and at the foot of 23d street.

SUMMERVILLE, BLUE MOUNTAIN & WALLA WALLA.—Surveys are not yet completed on this line from Union, Ore., via Summerville and Elgin, to

Athena or Walla Walla, Wash., about 80 miles. About 20 miles of the right of way passes over an old grade. The work is generally light, except 25 miles through the Blue Mountains, which will be medium heavy. No contracts will be let before spring. (Official.) The officers are given under Elections and Appointments. (Dec. 30, p. 938.)

TACOMA & COLUMBIA RIVER.—Grading is in progress on the extension from Lake Park, Wash., south about 30 miles to the Nisqually River, near Eve. D. N. Lydell, of Spanaway, Wash., has a portion of the contract. It is proposed to extend the road ultimately to The Dalles, Ore. (Dec. 16, p. 904.)

THUNDER BAY, NEPIGON & ST. JOSEPH.—Mr. Z. Malhart, of Ft. William, Ont., has returned from surveying this projected line from Port Arthur, Ont., via Dog Lake and Black Sturgeon Lake to Black Sturgeon Bay, on Lake Nepigon, 68 miles. The country is reported free from difficulties in building and well wooded. The people of Port Arthur and Ft. William are aiding financially, and an extensive immigration scheme is contemplated in connection with the road. The company expects to obtain the usual bonuses from the Dominion and Ontario governments and the municipalities en route. F. D. Burke, of Port Arthur, is among those interested. (Dec. 23, p. 924.)

VANCOUVER, VICTORIA & EASTERN.—This line as projected is to run from a point near English Bluff, on the Pacific Coast, in British Columbia, east about 230 miles, via Chilliwack to Penticton, and thence about 100 miles more to Midway in the Boundary Creek District. McKenzie, Mann & Co. of Vancouver control the charter. At Midway the line will connect with the Columbia & Western extension of the Canadian Pacific. Locating surveys have been made from Penticton toward Midway. But little survey work has been done west of Penticton. A little grading has been done from the Penticton end, and it is said that the company intends to complete the line within 18 months. The British Columbia Government has granted a subsidy of $4,000 per mile. (Sept. 9, p. 656.)

VINING & COLEMAN.—The company expects to begin grading in January on this line from Overall, Tex., south 20 miles to the Vining mines, on the Colorado River. W. L. Vining, of Austin, Tex., is President, and G. W. Sneed, Chief Engineer. (Feb. 4, 1898; p. 84.)

WABASH.—The officials have decded to build an independent line into Quincy, Ill., to be completed within the next two or three months. The stockholders recently authorized this road to run from East Hannibal, Ill., north 15 miles to Quincy. The company may use the Burlington tracks along the levee in Quincy. (Sept. 23, p. 697.)

WASHINGTON, WESTMINSTER & GETTYSBURG.—Grading is to be begun soon on this line from Gettysburg, Pa., south 86 miles via Littlestown, Pa., and Westminster, Md., to Washington, D. C. Contracts are let. J. B. Colegrove, of Washington, D. C., is President. (Sept. 9, p. 656.)

WEST VIRGINIA & KENTUCKY.—This company has been incorporated in Kentucky, with a capital stock of $25,000, to build a coal road from Devon, W. Va., south to Paw Paw, in Pike county. Among the incorporators are: F. C. Fischer, Coalgrove, O., and W. H. Briggs and Leon Isaacson, Ironton, O.

WHITE PASS & YUKON.—D. C. Fraser, M. P. for Guisboro, the chief promoter of this line, recently returned from Skaguay, where he has been inspecting the building. He reports that the chief difficulty is in keeping the men at work, 700 men having deserted in one day to go to the Atlin gold fields. The line is completed to the summit of White Pass, and there are several miles of track around Skaguay, where the company has extensive shops. L. H. Gray, the General Traffic Manager, is advertising for 2,000 more men, at from 35 to 60 cents an hour, board furnished by the company. There are 5,000 men now on the pay roll. G. W. Winter, the Purchasing Agent, is placing orders of about $10,000 per month for supplies and provisions, divided between Seattle and Vancouver. The company has opened an office in Vancouver, with J. H. Greer in charge as General Commercial Agent. The line is to be extended to Ft. Selkirk, with a branch to the Atlin Lake District. (Dec. 9, p. 886.)

WICHITA & SOUTHERN.—This company has been incorporated in Kansas to build a line from Wichita south through the coal fields near South McAlester, I. T., and across the Creek and Osage Nations to Denison, Tex., on the Missouri, Kansas & Texas. Among the directors are: J. Archibald Murray, New York; Wm. L. Watson, Hartford, Conn.; Rudolph Hatfield and A. H. Bentley, of Wichita. Offices will be maintained at Wichita, South McAlester and New York. The line is understood to be a feeder for the M., K. & T.

WICHITA FALLS & OKLAHOMA.—This company has been organized in Wichita Falls, Tex., and application made for a charter in that state, to run from Wichita Falls, on the Fort Worth & Denver City, north to some point in Indian Territory, to make a connection there with one of the northern trunk lines for St. Louis. The incorporators are: J. A. Kemp, R. E. Huff, A. Nuby, O. T. Bacon, G. B. Stone, R. M. Moore, O. J. Kendall, P. P. Langford, F. M. Avis, W. H. McGregor and H. M. Durrett, of Wichita Falls.

YAZOO DELTA.—According to press reports, grading is completed on both the extensions of this line from Ruleville, Miss., north 20 miles to Tutwiler, and from Moorehead south 15.5 miles to Lake Dawson, and track laying is to be begun soon. It is stated that the line is to be extended north from Tutwiler to some point near Memphis, Tenn., giving when completed, about 175 miles of line. (May 13, p. 349.)

YELLOWSTONE PARK.—The city of Bozeman, Mont., has granted right of way to this company through that city. W. W. D. Turner, of Spokane, Wash., is President. (Jan. 6, p. 16.)

## Electric Railroad Construction.

AKRON, O.—According to report, the Akron, Bedford & Cleveland Electric Ry. is surveying for an eight-mile branch line from a point above Cuyahoga Falls to Hudson. President, Henry A. Everett; Superintendent, F. J. Sloat.

ALEXANDRIA, IND.—J. Applegate of Perkinsville and others are interested in a project to build an electric railroad through the towns of Wheeling, Alexandria, Perkinsville and Noblesville.

ATLANTA, GA.—The Atlanta Consolidated St. Ry. Co. has applied for right of way to build an extension along the east side of the East Point road to Oakland City.

BALTIMORE, MD.—J. G. White & Co., engineers and contractors, of 29 Broadway, New York, inform us that they have not received the contract for the extension of the Baltimore, Middle River & Sparrow's Point Electric Ry. of Baltimore, as reported in this column last week. (Jan. 6, p. 16.)

The Baltimore City Passenger Ry. Co. is building an extension of the Fairmount avenue line to the Tome street line (Green Line), about one mile on Third street. The contractors are J. G. White & Co., New York.

BELFAST, ME.—According to report, James Mitchell, a railroad contractor and promoter of Bangor, Me., is to build a five-mile electric railroad this spring, between Belfast and Northport.

BELLEVILLE, ILL.—A franchise has been granted the Belleville Electric RR. Co. for the extension from the public square north on Illinois street to the city limits. Work is to be begun on the extension within 30 days. (Dec. 30, p. 939.)

BIDDEFORD, ME.—The Sanford & Cape Porpoise RR. Co. is receiving bids for an extension from Biddeford to York Beach, estimated to cost $4,000. Percy A. Richardson, Chief Engineer, Portland, Me.

BRADDOCK, PA.—Judge White, in a decision rendered Jan. 4, orders that the Braddock Electric Passenger Ry. Co. shall complete the road within 60 days. Oct. 28, p. 788.)

BUFFALO, N. Y.—The maps, plans and specifications submitted by the Buffalo Traction Co. for double tracking and extending the line have been approved by the Board of Public Works. The company has franchises to build 65 miles of line in the streets of Buffalo, of which about 15 are now in operation. E. G. S. Miller, President, 708 Ellicott Square, Buffalo.

CHATTANOOGA, TENN.—The Chattanooga Rapid Transit Co. was incorporated in Georgia, Jan. 10, with a capital stock of $125,000, which may be increased to $500,000. The company's proposed road is practically an extension of the C. R. T. Co. of Tennessee. It will run through the military park at Chickamauga, the Georgia end being at Rossville, a few miles from the Tennessee line. S. W. Divine is President of the old company. The primary object of the road is to make accessible the mining districts in the northwestern part of the state.

CHICAGO, ILL.—The limit of time for the completion of the Northwestern Elevated RR. has been extended by the City Council from January to Dec. 31.

COLUMBUS, O.—The Columbus & Buckeye Lake St. Ry. Co., which was chartered in April, 1894, has begun building the line on East Main street. The incorporators of the company are: James H. Anderson, D. C. Jones, Wm. H. Simonton and T. J Keating, who is the attorney of the company. The County Commissioners stopped work on the line because the company had not entered into a bond with the county to finish the work in a specified time. It is believed the time for completing the road will be extended.

DANBURY, CONN.—According to report, Hiram B. Scott of Ridgefield, Conn., and Cecil C. Higgins of 69 Wall street, New York, are interested in a project to build a railroad, presumably electric, 35 miles between Danbury, Conn., and Port Chester, N. Y.

EAST ST. LOUIS, ILL.—The Mississippi Valley RR. Co., which was incorporated last June to build an electric railroad between East St. Louis, Edwardsville and Alton, has made application for certain modifications to the terms and conditions in the franchises recently granted for right of way through Edwardsville. The company has also petitioned for right of way through Collinsville. In August last it was reported that the East St. Louis & Collinsville Electric RR. had been secured by the Mississippi Valley RR. Co.

According to report, a company has been formed of St. Louis and East St. Louis capitalists to build an electric railroad to connect 11 towns on the east side of the Mississippi River from East St. Louis to Alton, Ill. Charles E. Carroll and August Holthaus, of St. Louis, Mo., are reported as President and Secretary. The proposed road will be 75 miles. This seems to be the Mississippi Valley RR. Co.

IOLA, KAN.—The railroad which the Iola Rapid Transit & Electric Light Co. is to build is a single track extension of six and a half miles to La Harpe. One bridge will be needed, also an entire new equipment of cars. No time has been agreed upon for letting of contracts. A. M. Beck, Secretary. (Jan. 6, p. 16.)

JACKSON, MISS.—General S. T. Carnes of Memphis, Tenn., Frank C. Jones, P. C. Bigley and Louis Jones have arrived in Jackson and set up an office as headquarters for the company which is to build the electric road and light plant in Jackson. According to report, the material for the line is already bought and shipped. The company expects to have the line in operation within 60 days. No bonds have been issued. (Sept. 2, p. 639; Dec. 2, p. 869.)

JERSEY CITY, N. J.—An agreement has been reached between the North Jersey St. Ry. Co. and the North Hudson Ry. Co., by which the latter company is permitted to run cars from the D., L. & W. station in Hoboken by way of Grove street to Jersey City. This change removes the last horse cars in Jersey City. (Oct. 14, p. 751.)

LOGANSPORT, IND.—The company which was recently incorporated, with a capital stock of $100,000, to build an electric railroad between Logansport and Indianapolis, is the Indianapolis & Logansport Traction Co. The incorporators are Geo. J. Marott, Horace F. Wood, Robert C. Light, Broad Ripple; A. R. Hovey, Michael A. Jordan, of Logansport; John C. Ruckelshaus. Louis C. Walker, Indianapolis, counsel for the company, has already applied for right of way over the Michigan road to the county line. It is intended to build from Indianapolis to Logansport, and from there to Warsaw, and also a branch through Logansport to Frankfort. In all, the road will be about 60 miles. The road is to carry freight. (Jan. 6, p. 16.)

LORAIN, O.—According to report, Parks Foster and D. C. Foster of North Amherst are interested in the project to build an electric railroad from Lorain to North Amherst. This project has been considered for about three years.

LYNCHBURG, VA.—At a meeting held in New York Dec. 30, the Directors of the Lynchburg Electric Ry. & Light Co. let a contract to the Virginia Paving Brick Co. for rebuilding the company's line. The contract is for $70,000. R. A. C. Smith, President; D. D. Mallory, 100 Broadway. (July 22, p. 538.)

MOUNT VERNON, N. Y.—The Westchester Electric RR. Co. of New York, controlled by the Union Ry., filed on Jan. 6 with the Secretary of State a certificate for extension, as follows: From the intersection of Old Boston Post road and Pelhamdale avenue in the village of Pelham Manor, to the Boston Turnpike, and along the turnpike to the boundary line of New Rochelle; also along Pelhamdale avenue from Boston Turnpike road to the Shore road, and along the Shore road to the boundary line of New Rochelle; and also along Boston Turnpike from Pelhamdale avenue to the boundary line of New Rochelle. (Dec. 9, p. 886.)

The franchise recently granted to the New York, Westchester & Connecticut Traction Co. for a line on Chester Hill, and also for a line to Pelham, White Plains and Harlem, has been revoked. Some time ago a franchise was granted to the Union Ry. Co., with the understanding that it was to apply for the franchise granted the N. Y., W. & C. T. Co. The application was in at a specified time, but was reported withheld by the City Clerk. The N. Y., W. & C. T. Co., which was anxious to secure right of way through Mt. Vernon, applied for this route in the meantime and secured it. (Dec. 16, p. 905.)

MYERSVILLE, MD.—The recently completed Catoctin & Myersville Electric Ry., 5½ miles long, between Middletown and Myersville, to connect with the Frederick & Middletown Electric Ry., has been transferred by the contractors, Messrs. Douglass Bros., of Millersville, Pa., to the owners. The line has been leased to the Frederick & Middletown Ry., the directors of which are practically the same as the C. & M. The total cost of the new line was $47,000. Geo. W. Smith is President of the F. & M (March 25, p. 225; Oct. 21, p. 769.)

NEWARK, N. J.—The ordinance granting the North Jersey St. Ry. Co. to build on Springfield avenue, between Irvington and Newark, was passed by the Town Council of Irvington on Jan. 3. The time for the completion has been set for May 1.

NEW ORLEANS, LA.—General Manager C. D. Wyman of the New Orleans Traction Co. has submitted plans to the city for the rearrangement of tracks of the company on Canal street.

NEW YORK, N. Y.—The State Railroad Commission will give hearings on Jan. 17 in New York on the applications of the Metropolitan St. Ry. Co. for a change of motor power from horses to underground electric on parts of the system.

OAKLAND, CAL.—The Oakland Transit Co. is building a connecting link between East and West Oakland by way of Eighth street. At the present time the company has several franchises which are not being used. At present the two lines are of different gage and the passengers have to be transferred. The company is considering plans to make the system one gage. New cars will be needed when the work is finished.

PITTSBURGH, PA.—The Wilkensburg & East Pittsburgh St. Ry. Co., which is projected to run from a point in the Borough of Wilkensburg to Edgewood, Swissvale, North Braddock and East Pittsburgh, has no connection with the Monongahela St. Ry Co., although several individuals are large stockholders in both companies. The total length of the W. & E. P. will be 5½ miles. The President of the company is F. C. Kay, and Secretary and Treasurer L. G. Woods, both of Pittsburgh. At present the amount of capital stock is nominal, the company not having as yet completed its organization or decided on capitalization. (Dec. 30, p. 939.)

PROVIDENCE, R. I.—The Union RR. Co. is to petition the City Council and also the East Providence Town Council for a right to connect the lines via South Water and Tockwotten streets, and also to build a double track on Washington bridge. The company is also to extend its tracks in East Providence to the depot of the Warren & Bristol branch of the N. Y., N. H. & H. A. T. Potter, General Manager.

REVERE, MASS.—According to report, Geo. Forebush and others have applied for a franchise to build an electric railroad line along the water front from Crescent Beach to the Winthrop line.

ROCHESTER, MICH.—The Town Board on Dec. 30 granted a franchise to John Winters and O. H. Lau, of Detroit, for an electric railroad to connect with the proposed line to Orion, of which they are also the promoters. (Dec. 16, p. 905.)

SYRACUSE, N. Y.—A hearing of the application of the Syracuse, Skaneateles & Moravia RR. Co. was held by the Railroad Commissioners at Albany, N. Y., Jan. 3. Another hearing will be held Jan. 10 at Moravia. This company proposes to build an electric railroad to connect the towns of the names in the title. Wing T. Parker of Moravia is President.

TEMPLETON, MASS.—P. Blodgett informs us in reference to the Templeton St. Ry. Co., which was incorporated in 1896, that the subscriptions are now being taken for the capital stock and it looks as though the road might be built soon. The proposed road is from the Fitchburg RR. depot in Gardner to the Boston & Albany depot in Templeton. The capital stock of the company is not to exceed $50,000. The franchise was recently extended.

TOLEDO, O.—F. E. Seagrave, of Toledo, is reported as having secured the right of way for an electric railroad from West Toledo on Sylvania avenue, to Monroe street, thence through Sylvania, O., 20 miles west to Lyons.

WEYMOUTH, MASS.—The Selectmen of Holbrook have granted a right of way to the Holbrook & Weymouth Electric Ry Co., from Holbrook Square through Plymouth and Weymouth streets to the Weymouth line. It is believed this road will be the connecting link between the lines of the Brockton St.

Ry. and the Weymouth & Braintree Ry., forming a new short route from Brockton to Nantasket. Work, according to report, is to be begun early in the spring.

WILLIAMSBURG, MASS.—The officers of the Western Hampshire Electric Ry. Co., which has been organized to build an electric railroad between Williamsburg and Cummington, are: President, John C. Hammond; Treasurer, J. A. Sullivan; Secretary and Clerk, H. P. Field. Preliminary surveys have been completed for this line, but it is not likely to be built very soon. (Aug. 12, p. 587.)

WORCESTER, MASS.—The Blackstone Valley St. Ry., which is operated by the Worcester & Suburban St. Ry. Co., is considering an extension to Worcester, to be built in the spring. The agreement under which the W. & S. St. Ry. controls the B. V. expires June 1, 1899, and it is said there will be a change of some kind. After the agreement expires the company will have no way of reaching Worcester until the contemplated extension is built. Edwin L. Watson, President and General Manager W. & S. St. Ry. (March 4, p. 170.)

## GENERAL RAILROAD NEWS.

### Railroad Earnings.

Showing the gross and net receipts for the periods ending at the dates named:

| Nov. 30. | | 1898. | 1897. | Inc. or Dec. | |
|---|---|---|---|---|---|
| **Chicago, Indianapolis & Louisville.** | | | | | |
| 1 month | Gross | $274,109 | $280,743 | D. | $6,634 |
| 1 " | Net | 74,454 | 81,534 | D. | 7,080 |
| 5 months | Gross | 1,509,151 | 1,527,794 | D. | 18,643 |
| 5 " | Net | 511,198 | 498,570 | I. | 12,628 |
| **Chicago, Rock Island & Pacific.** | | | | | |
| 1 month | Gross | $1,882,356 | $1,852,589 | I. | $29,767 |
| 1 " | Net | 705,370 | 721,599 | D. | 16,229 |
| 8 months | Gross | 14,882,502 | 13,474,193 | I. | 1,408,309 |
| 8 " | Net | 5,437,228 | 5,015,714 | I. | 421,514 |
| **Cleveland, Cincinnati, Chicago & St. Louis.** | | | | | |
| 1 month | Gross | $1,249,601 | $1,249,601 | I. | $40,122 |
| 1 " | Net | 264,151 | 266,620 | I. | 97,531 |
| 5 months | Gross | 6,430,847 | 6,095,822 | I. | 335,025 |
| 5 " | Net | 1,869,911 | 1,383,002 | I. | 486,909 |
| **Flint & Pere Marquette.** | | | | | |
| 1 month | Gross | $275,453 | $247,229 | I. | $28,224 |
| 1 " | Net | 75,103 | 72,821 | I. | 2,282 |
| 11 months | Gross | 2,781,964 | 2,532,783 | I. | 249,181 |
| 11 " | Net | 719,605 | 673,505 | I. | 46,100 |
| **Mexican International.*** | | | | | |
| 1 month | Gross | $313,993 | $251,526 | I. | $62,467 |
| 1 " | Net | 140,802 | 89,721 | I. | 51,081 |
| 11 months | Gross | 3,082,310 | 2,757,418 | I. | 324,892 |
| 11 " | Net | 1,246,900 | 1,000,827 | I. | 246,073 |
| *Mexican currency. | | | | | |
| **Mexican National.*** | | | | | |
| 1 month | Gross | $585,630 | $494,622 | I. | $91,008 |
| 1 " | Net | 292,962 | 236,020 | I. | 56,942 |
| 11 months | Gross | 5,712,517 | 5,481,482 | I. | 231,035 |
| 11 " | Net | 2,684,951 | 2,667,527 | I. | 17,424 |
| *Mexican currency. | | | | | |
| **Philadelphia, Wilmington & Baltimore.** | | | | | |
| 1 month | Gross | $836,459 | $753,859 | I. | $82,600 |
| 1 " | Net | 278,749 | 226,649 | I. | 52,100 |
| 11 months | Gross | 9,090,518 | 8,348,818 | I. | 741,700 |
| 11 " | Net | 2,508,804 | 2,220,204 | I. | 288,600 |
| **Rio Grande Western.** | | | | | |
| 1 month | Gross | $288,098 | $290,601 | D. | $2,503 |
| 1 " | Net | 128,206 | 108,109 | I. | 20,097 |
| 5 months | Gross | 1,471,340 | 1,529,784 | D. | 58,444 |
| 5 " | Net | 577,847 | 672,247 | D. | 94,400 |
| **Southern Pacific.** | | | | | |
| 1 month | Gross | $5,400,852 | $4,896,881 | I. | $503,971 |
| 1 " | Net | 2,000,153 | 2,112,848 | D. | 112,695 |
| 5 months | Gross | 25,499,075 | 23,658,184 | I. | 1,840,891 |
| 5 " | Net | 10,033,874 | 10,099,324 | D. | 65,450 |
| **Union Pacific, Denver & Gulf.** | | | | | |
| 1 month | Gross | $351,908 | $358,279 | D. | $6,371 |
| 1 " | Net | 150,966 | 147,833 | I. | 3,133 |
| 11 months | Gross | 3,461,459 | 3,215,401 | I. | 246,058 |
| 11 " | Net | 1,187,007 | 912,143 | I. | 274,864 |
| **Western New York & Pennsylvania.** | | | | | |
| 1 month | Gross | $295,462 | $317,892 | D. | $22,430 |
| 1 " | Net | 114,013 | 121,010 | D. | 6,997 |
| 5 months | Gross | 1,441,297 | 1,578,122 | D. | 136,825 |
| 5 " | Net | 460,919 | 645,351 | D. | 184,432 |

| Dec. 31. | | 1898. | 1897. | Inc. or Dec. | |
|---|---|---|---|---|---|
| **Great Northern System.** | | | | | |
| 1 month | Gross | $2,232,709 | $1,881,184 | I. | $351,525 |
| 6 months | Gross | 14,486,664 | 12,988,090 | I. | 1,498,574 |
| **New York Central & Hudson River.** | | | | | |
| 1 month | Gross | $3,837,936 | $3,600,825 | I. | $237,111 |
| 3 months | Gross | 12,238,232 | 11,734,150 | I. | 504,082 |
| 6 " | Gross | 23,632,629 | 24,013,098 | D. | 380,469 |

BALTIMORE & OHIO SOUTHWESTERN.—The directors have endorsed the plan of reorganization as recently published (Dec. 23, p. 925), and urgently recommend its acceptance. On Jan. 4, Joseph Robinson, connected with the Norfolk & Western, was appointed co-receiver with Judge Harmon. (Jan. 6, p. 17.)

Another suit for foreclosure of mortgages on this property was brought Jan. 9 at the U. S. Court at Cincinnati. The suit is by the Farmers' Loan & Trust Co., New York, for $46,441,000, as follows: First mortgage bonds, $11,000,000; first income, $5,500,000; second income, $6,400,000; third income, $7,070,000; O. & M. bonds, $112,000, $6,501,000, $3,213,000, $2,009,000 and $4,006,000.

BOSTON & LOWELL.—At the annual meeting of the stockholders, held at Boston, Jan. 4, it was voted to authorize the issue of 20-year coupon bonds to the amount of $620,000, dated July 1, 1898, at a rate not exceeding 4 per cent., payable semi-annually. These bonds are to take the place of a like amount of 5 per cent. bonds, due July 1, 1899.

BROOKLYN ELEVATED.—At a meeting of the reorganization committee, held Jan. 5, the incorporation of a new company was authorized, to be called the Brooklyn Union Elevated RR., which will acquire all the property and franchises of the old Brooklyn Elevated, the Union Elevated and the Seaside & Brooklyn Bridge. The plan of reorganization provides for the immediate issue of about $12,000,000 in first mortgage bonds, $3,300,000 in 5 per cent. preferred stock, and $13,000,000 in common stock. It is expected that the company will take possession before Feb. 1. The property was sold under foreclosure at Brooklyn, Nov. 11, to the reorganization committee. (Nov. 18, p. 839.)

CAPE FEAR & YADKIN VALLEY.—This property, sold Dec. 29 to the Atlantic Coast Line for $3,110,000, is to be reorganized as soon as that company can obtain possession, under the name of the Atlantic & Yadkin. (Jan. 6, p. 17.)

CHICAGO, BURLINGTON & QUINCY.—Sealed proposals addressed to the New England Trust Co., Boston, will be received until noon, Jan. 14, for the sale of Denver extension 4 per cent. bonds, due Feb. 1, 1922, to absorb $82,574, interest on the accepted bonds to cease Jan. 16.

CHICAGO, FORT MADISON & DES MOINES.—This property was sold at foreclosure sale by W. I. Babb, Special Master, at Keokuk, Ia., Jan. 4, to Jesse A. Baldwin of Chicago, representative of the bondholders' committee, for $150,000. The line runs from Fort Madison, Ia., to Ottumwa, 71 miles, and went into the hands of the receiver July 28, 1898. (Nov. 11, p. 822.)

The new C., F. M. & D. M. was incorporated in Iowa Jan. 5, with a capital stock of $852,000. The new Board of Directors is composed of the following men from Fort Madison, Ia., Boston and Chicago: Isaac T. Burr, E. S. Conway, G. T. W. Braman, William H. Atlee, Samuel Atlee, G. D. Braman, E. H. Skinner, E. F. Potter and Jesse A. Baldwin.

COLUMBUS, HOCKING VALLEY & TOLEDO.—J. P. Morgan & Co. has announced a plan of reorganization of this company. The plan provides in substance for the issue of $20,000,000 first consolidated mortgage 100-year 4½ per cent. gold bonds, to bear interest from July 1, 1899. Of these, $7,155,000 is to be used to replace existing undisturbed bonds; $3,200,000 in partial exchange for disturbed bonds, $4,000,000 to be sold for cash, and $5,645,000 to be reserved for buying new properties and for betterments and enlargements. Preferred stock, 4 per cent. non-accumulative, will be issued to an aggregate not exceeding $10,000,000, and common stock to an amount not exceeding $6,000,000. The above amounts of stock may be increased to $5,000,000 preferred, and $5,000,000 common, for acquiring interests in the Toledo & Ohio Central, and the Columbus, Sandusky & Hocking, or successor companies, if thought practicable and desirable.

The basis for exchange of existing bonds and stocks is as follows: Old 5 per cent. bonds will receive 40 per cent. in new bonds, and 65 per cent. in preferred stock. Old 6 per cent. bonds will receive 50 per cent. in new preferred stock, and old 4 per cent. bonds, face value in preferred stock. Holders of old preferred stock, on paying $25 per share for new preferred, and $12.50 per share for new common stock, will receive 20 per cent. in new preferred and 20 per cent. in new common. Holders of old common stock, on paying $12.50 per share for new common stock, will receive 40 per cent. of new common stock.

A syndicate has been formed which undertakes to furnish the estimated cash requirements for the plan. Holders of existing certificates for bonds heretofore deposited, must present the same to the office for stamping as assenting to the plan. Payments by stockholders must be at the office of J. P. Morgan & Co., in two installments at least 30 days apart, when called for by advertisement. The present fixed charge is about $1,200,000, and the fixed charge under reorganization is estimated at about $750,000, which would be somewhat reduced when the old 7 per cent. bonds maturing from 1900 to 1910 are replaced by the new 4½ per cent. bonds. (Dec. 16, p. 905.)

CUMBERLAND & OHIO.—The bondholders of the Northern Division have filed an appeal from the judgment of foreclosure and sale recently granted by Judge Carroll. This appeal will be argued before the Court of Appeals in Kentucky in February. It stopped the contemplated sale at the upset price of $25,000 on Monday last.

DETROIT & LIMA NORTHERN.—The company has filed its answer in the U. S. Court to a suit brought by the Manhattan Trust Co. of New York for foreclosure. It admits that certain bonds were executed and are secured by a mortgage, but denies that the interest on these bonds was at any time defaulted, and asks to be dismissed from the suit. The road went into the hands of receivers on Sept. 6, 1898. (Sept. 16, p. 680.)

DULUTH, MISSABE & NORTHERN.—Holders of first consolidated mortgage bonds of Jan. 1, 1893, are notified that the company will receive proposals to sell as many of the same at a rate not to exceed 105 and accrued interest, as will consume not more than $71,108, at the Central Trust Co., New York, prior to 12 o'clock noon, Jan. 15.

FRANKLIN & PITTSYLVANIA (Southern).—The Southern has been seeking the courts to obtain a release from its contract with the F. & P., but Judge Whittle, at Richmond, decided against the Southern, and that company has taken an appeal to the Supreme Court of Kentucky, which is now hearing the case. The F. & P. is 29.9 miles long, and is leased to the Virginia Midland line of the Southern, until July 1, 1913, at an annual rental of $7,000. The Southern bought $74,500 of the bonds in 1897, at a cost of $82,655, the intention being by this means to relieve the V. M. of the cost of the lease.

GRAND TRUNK.—This company on Jan. 3 filed with the State Court of Claims of New York a claim for $31,529 for filling two slips which formed a part of the Erie Canal in Buffalo. It also asks $15,000 damages for the loss of their use, and $1,529 for injuries to the wall of a storehouse situated near.

GULF, BEAUMONT & GREAT NORTHERN.—This company and the Gulf, Beaumont & Kansas City have announced their intention of applying to the coming Legislature of Texas for a special law authorizing a consolidation of the properties of the two companies, with authority to lease or buy a line of railroad from the state line of Texas into the city of Shreveport, La. The G., B. & G. N. was organized in Texas in April, 1898, to take over the property of the G., B. & K. C., and to make further extensions, and work is now in progress on the extension from Beaumont, Tex., northward to Jefferson, 60 miles.

LANCASTER & READING NARROW GAGE.—The Pennsylvania RR. Co. has acquired a controling interest in this property, but it does not propose to make any change in the present method of management. The line runs from Lancaster, Pa., to Quarryville, 15.25 miles, and has a capital stock of $350,000.

LITTLE ROCK, HOT SPRINGS & TEXAS.—This property was sold at public auction Jan. 4, at Hot Springs, Ark., to the Fordyce Syndicate, for $50,000, the upset price. The same syndicate bought the road at a private sale Dec. 5, but Judge Williams refused to confirm the sale. (Dec. 16, p. 905.) It is understood that an agreement exists between the Fordyce Syndicate, the Kansas City, Pittsburgh & Gulf, the Choctaw, Oklahoma & Gulf, and the Texas Midland, which is to be extended from Paris, Tex., to Mena, Ark., connecting with the K. C., P. & G., which line would then be extended into Hot Springs, Ark., connecting with the L. R., H. S. & T., and further that traffic arrangements would be entered into with the C., O. & G. into Memphis, Tenn., upon the completion of that line.

LITTLE ROCK & MEMPHIS.—The property of this company, sold at public auction to the bondholders' committee, on Oct. 25, formally passed under the control of the Choctaw & Memphis line of the Choctaw, Oklahoma & Gulf at midnight, Dec. 31. (Dec. 16, p. 905.)

NEW YORK, ONTARIO & WESTERN.—All the coal properties of the Allegheny Iron & Steel Co. in and about Scranton, Pa., have been bought by parties interested in the N. Y., O. & W., which secures to that company the transportation of all the coal products of the mines, estimated at from 25,000,000 to 30,000,000 tons of anthracite coal. The capacity of the mines now open is about 800,000 tons per annum. The price paid by the syndicate is stated at $4,000,000.

NORTHERN CENTRAL (P. RR.).—At a meeting of the Board of Public Works, held at Annapolis, Md., Dec. 30, a resolution was adopted authorizing the Treasurer to advertise for sale to the highest bidder the annuity of $90,000 of the N. C., representing the 6 per cent. mortgage loan for $1,500,000, made by the state in 1834, to the Baltimore & Susquehanna, which was consolidated with the N. C. in 1854. (July 22, 1898, p. 540.)

NORTHERN OF NEW JERSEY.—President E. B. Thomas of the Erie announces that application will be made to the New Jersey Legislature at the coming session for the passage of an act giving the state's consent to a lease of the N. of N. J. to the Erie, providing for a merger of the stock, property and franchises of the two companies. The N. of N. J. runs from Bergen Junction, N. J., to Sparkill, N. Y., 21.54 miles, and leases the Nyack & Northern, 4.51 miles. Since the road was opened in 1859, it has been operated by the Erie, at a rental equal to 35 per cent. of the gross earnings, less charge for the use of the depot at Jersey City, until July 15, 1897, when a majority of the stock having been acquired by the Erie, direct control was assumed.

OGDENSBURG & LAKE CHAMPLAIN.—Fuller reports as to the purchase of this road by the Rutland are that a syndicate headed by Percival W. Clement, President of the Rutland, and including W. Seward Webb, Chauncey M. Depew and W. K. Vanderbilt, of New York, and Geo. H. Ball, of Boston, has bought the securities of the road deposited under the plan of reorganization, the price being 103 for the old bonds and accrued interest to Feb. 1, 1899, making a total of $1,170 for each bond. The bondholders have the option until Jan. 21, instead of taking cash, to take new 4 per cent. 50-year gold bonds of the O. & L. C., drawing interest from Jan. 1, 1899, and indorsed by the Rutland, at 102½, which includes $140 in cash. It is stated that the Rutland Co. will immediately build from Burlington to a connection with the O. & L. C., at Rouse's Point, N. Y., 40 miles. (Jan. 6, p. 18.)

OHIO SOUTHERN.—By a decision of the U. S. Circuit Court at Lima, O., Jan. 5, confirmation of the foreclosure sale of this road is indefinitely delayed. The court vacated the order of Judge Richie, granting allowances under the receivership, which the purchasers declared were excessive. The property was sold Oct. 15 to the first mortgage bondholders. (Oct. 21, p. 700.)

PHILADELPHIA & READING.—Holders of 10-year sinking fund 5 per cent. coupon bonds of 1902 are notified that 32 of these bonds were drawn for payment on Jan. 3, to be paid Feb. 1, at the office of the trustee, 517 Chestnut street, Philadelphia, after which date interest will cease.

PHILADELPHIA, READING & NEW ENGLAND.—A circular signed by the reorganization committee is being sent to holders of certificates of first mortgage bonds, offering to buy about 49 per cent. of their holdings at prices a little better than those offered under the foreclosure sale, as follows: 4's, $624.91; 4's and 5's, $671.60; 5's, $702.63. The offer was to hold good until Jan. 10, and holders will be notified before Jan. 21 if a sufficient amount has been received to carry out the purchase. It is stated that the plan does not comprehend a transfer of a controlling interest to outside parties. (Jan. 6, p. 18.)

SEABOARD AIR LINE.—A syndicate headed by John L. Williams & Sons of Richmond, Va., and Middendorf, Oliver & Co. of Baltimore, has offered to buy the stock of the Seaboard & Roanoke, which controls the S. A. L., at a price which President Hoffman of that company recommends the holders to accept. The total issue of stock is $1,388,400, of which some $832,100 is held in the Hoffman pool and is subject to sale upon the vote of three-fourths in amount of the certificates of deposit representing the same. The price offered is said to be $200 for each $100 share. The syndicate will also buy, according to report, the stock in other companies of the system. Other members of the purchasing syndicate are reported to be the Richmond Safe & Trust Deposit Co., the Mercantile Trust & Deposit Co. of Baltimore, the Baltimore Trust & Guarantee Co., and the Produce Exchange Trust Co. of New York.

Thos. F. Ryan of New York, who owns 2,700 shares of C. & R. stock, filed an application for an injunction in the U. S. Circuit Court at Baltimore, Jan. 5, to restrain Louis McLane, as a member of the pooling committee, from transferring some 3,000 shares of stock of the company to any person other than Mr. Ryan. The court is also asked to compel Mr. McLane to deliver this stock to Mr. Ryan at $125 per share, in accordance with an agreement made Oct. 6, 1896. On Jan. 7 Mr. Ryan filed a bond in the Circuit Court for $200,000, and Judge Wickes approved the bond and signed the order for the injunction. John Skelton Williams, President of the

Georgia & Alabama Ry., and prominent in the syndicate, is reported as saying as follows:

"I do not apprehend that there will be any serious trouble caused by the action taken by Mr. Ryan. It may postpone the full development of our plan for a short while. Our contract with President R. Curzon Hoffman calls for the delivery of 7,400 shares of Seaboard & Roanoke stock. I expect Mr. Hoffman's directors will be in a position to inform us to-morrow whether they can do so.

"I am not at liberty to divulge our plan in full at present, as the details will have to be worked out. The syndicate, however, will maintain the Seaboard Air Line as an independent system. The purchase was not made in the interest of any other railroad company, nor has the Southern, the Atlantic Coast Line, or the Pennsylvania the least interest in the syndicate. We bought the property as an investment, and will operate it on our own account, and not in connection with any other system."

SIOUX CITY, O'NEILL & WESTERN.—Judge Shiras, of the Federal Court at Sioux City, Ia., has refused to extend to the Credits Commutation Co. of Sioux City the time for redeeming from J. Kennedy Tod & Co. of New York the $2,340,000 first mortgage bonds of this company and the $1,060,000 stock of the Sioux City & Northern, which expired Jan. 8. It is announced that the Credits Commutation Co. will abandon both lines, but will bid for the Sioux City, O'Neill & Western at the foreclosure sale. (Dec. 9, p. 887.)

SOUTH BOUND (FLORIDA, CENTRAL & PENINSULAR).—The Mercantile Trust & Deposit Co. of Baltimore, Md., and the Baltimore Trust & Guaranty Co. offer for sale $1,000,000 of their recent purchase of $1,500,000 5 per cent. bonds of the S. B., which have been held by the Mercantile Trust & Deposit Co. as trustees of the Savannah Traction Co. (Sept. 23, p. 698.)

TEXAS & NEW ORLEANS.—The Atlantic Trust Co. of New York invites proposals for first mortgage bonds, maturing in August, 1905, at a rate not to exceed 10 per cent. above par for as many as $27,500 will buy.

TEXAS MEXICAN.—The Attorney General of Texas has brought suit against this company for forfeiture of its charter, on the ground that it does not comply with the law requiring it to maintain a general office in that state. The T. M. is a subordinate line of the Mexican National.

WESTERN MARYLAND.—The $120,000 of Baltimore & Hanover first mortgage 6 per cent. bonds, due Jan. 1, 1899, have been paid at the Mercantile Trust & Deposit Co., Baltimore.

WHEELING & LAKE ERIE.—H. F. Carleton, Special Master, advertises this property for sale Feb. 7 at 12 o'clock noon, at the passenger station of the company in Toledo, O. The sale is subject to the $3,000,000 mortgage of 1886 to the Mercantile Trust Co. of New York as trustees, the $1,500,000 mortgage of April 21, 1888, and the $1,624,000 mortgage of Dec. 28, 1889, to the Central Trust Co. of New York, as trustees. Also to the following claims: Dick Bros. & Co. and others, representing the stockholders, $76,875 with interest from Sept. 30, 1897, Lewis Fitzgerald and others representing security holders of the company for various sums aggregating $519,309 with interest from September, 1898. The property is to be sold as an entirety, $1,000,000 being the upset price. Each bidder must deposit a certified check of $200,000 or $500,000 par value of bonds secured by the consolidated mortgage. (Dec. 23, p. 926.)

## Electric Railroad News.

BROOKLYN, N. Y.—The gross earnings of the Brooklyn Rapid Transit Co. for periods ending Dec. 31, as compared with previous years, were as follows:

| | 1898. | 1897. | 1896. |
|---|---|---|---|
| 1 month | $472,500 | $429,874 | $413,290 |
| 6 months | 3,087,233 | 2,701,413 | 2,623,726 |
| 12 months | 5,847,568 | 5,182,911 | 5,065,871 |

Secretary T. S. Williams of the Brooklyn Rapid Transit Co., on Jan. 8, in order to set at rest the recent rumors concerning the readjustment of Brooklyn street railroad companies, issued a statement that the reports are mere speculations.

CHICAGO, ILL.—The Metropolitan West Side Elevated RR., of Chicago, was bid in Jan. 4 by the Chairman of the Reorganization Committee for $6,000,000, at the public sale announced in our issue of Nov. 25 (p. 849). The company's present securities are $15,000,000 5 per cent. first mortgage bonds, on which there is due $1,552,675 defaulted interest, and $15,000,000 stock. The reorganization plan contemplates scaling the bond issue to $10,000,000 forty-year 4 per cent. gold bonds, of which $9,000,000 will go to holders of the existing bonds, $600,000 will be taken at par by the holders of the existing stock, and $400,000 will be retained in the treasury. There will be $9,000,000 of 5 per cent. non-cumulative preferred stock, of which $8,000,000 will go to the holders of the present bonds, $835,000 for the obligations and floating debt of the old company, and $165,000 will be reserved for reorganization expenses. There will also be $7,500,000 of new common stock to go to the holders of the existing issue, which is scaled 50 per cent.

The Reorganization Committee consists of F. P. Olcott, W. G. Oakman and Samuel Thorne.

The gross earnings of the West Chicago St. RR. for the year 1898 were $3,979,936, an increase of $130,266 over the previous year.

The gross earnings of the North Chicago Electric Ry. for the year 1898 were $2,921,425, an increase of $103,026 over the previous year.

The Branch Appellate Court, Jan. 4, passed on the litigation between the Chicago & Western Indiana RR. Co. and the General Electric Ry. Co., over the disputed right of way at Plymouth and Custom House places. The temporary injunction has been continued restraining the General Electric Co. from laying its tracks across the right of way of the C. & W. I. at any of the disputed points. (See Scrap Heap, Nov. 25, p. 849.)

The Appellate Court, on Dec. 29, granted a writ of error on the petition of Theron Butterworth and other stockholders of the Chicago & South Side Rapid Transit RR. Co. The petitioners, who represent $1,200,000 of the capital stock of the C. & S. S. R. T. RR., claim that they have not been properly treated under the reorganization, which took place in 1897. The granting of the writ will be upon the arguments under the proceedings of which the property has been reorganized under the name of the South Side Elevated RR. Co.

DENVER, COL.—The Denver City Tramway Co., which is to be the consolidation of the Denver City Ry., the West End St. Ry., and the Denver Consolidated Tramway Co., filed articles of incorporation Dec. 31. The capitalization of the reorganized company is $1,450,000. The incorporators and the Board of Directors for the first year are Samuel M. Perry, Charles B. Whitehead, David F. Bowen, J. Fred Zell, Charles F. Musgrove, William B. Peck and Harry W. Thomas. The plan of the consolidation of these companies was outlined in this column Dec. 23, 1898, page 926. Several extensions and improvements are contemplated by the new company.

DUBUQUE, IA.—Judge Shiras, in the Federal Court, Jan. 5, ordered the Eighth Street Electric Ry., operated by the Dubuque Light & Traction Co., to be sold on March 6. This company has been in the hands of a receiver since Dec. 1, 1894. The capital stock is $600,000, and the company is in default of a mortgage of $385,000 of 1893, which bears 6 per cent. The Old Colony Trust Co. of Boston is trustee of the mortgage.

ELWOOD, IND.—The Elwood Electric St. Ry. was sold Jan. 2 to the Union Traction Co. of Anderson, Ind. The E. E. St. Ry., which is a consolidation of the Elwood Electric Light & Power Co. and the Elwood Electric St. Ry. Co., was chartered in 1891 for 50 years. The company, which operates five miles of electric road, is capitalized at $100,000, with a funded debt of $43,300. J. H. DeHority is President. The Union Traction Co., the purchasing company, has already completed a line from Anderson to Alexandria, and is about to build 16 miles between Elwood and Anderson. The E. E. St. Ry. will form part of the system in Elwood. (March 18, p. 209.)

HOOSICK FALLS, N. Y.—The new officers of the Bennington & Hoosick Valley Electric RR. are: President, Watson M. Holmes; Treasurer, Irving E. Gibson; Secretary, Charles B. Story.

JERSEY CITY, N. J.—A meeting of the stockholders of the North Hudson County Ry. Co., which was sold last week, was held in Hoboken Jan. 5. All the officers and Directors tendered their resignations. Those of President Myles Tierney, Secretary W. C. Doubleday and the Directors were accepted, but the resignations of the other officers were laid over until the annual meeting, Jan. 24. The new Directors chosen are: John W. Omberson, John Kean, John F. Shanley, John I. Waterbury, David Young, W. G. Shaller, John I. Walter, John D. Crimmins and Allan L. McDermott. At a meeting of the Directors held later these officers were chosen: President, David Young, who is also Vice-President and Manager of the North Jersey St. Ry. Co., to succeed Myles Tierney, whose stock was purchased last week by Bernard M. Shanley; Secretary, W. C. Doubleday; Treasurer, W. G. Shaller. William H. Starr is to remain as General Manager. (Jan. 6, p. 18.)

LEBANON, PA.—At the annual meeting of the Lebanon & Annville St. Ry. Co., held Jan. 9, S. P. Light was elected President, to succeed J. M. Shenk, heretofore President and General Manager. Mr. Light also succeeds Mr. Shenk as President of the Lebanon & Myerstown St. Ry. Co. Mr. Shenk had held office since the road was started, in 1890.

MERIDEN, CONN.—The Meriden, Southington & Compounce Tramway Co. has placed a first mortgage with the Colonial Trust Co. of New York for $100,000 5% 30-year gold bonds. This company recently secured permission to increase its capital stock to $500,000, and to extend the line about 40 miles. Francis Atwater, President.

PATERSON, N. J.—Corporation Attorney Jas. F. Minturn, of Hoboken, has been directed by the Common Council of that city to apply to the U. S. Circuit Court for an order to vacate the restraining order granted several months ago preventing anybody from interfering with the property of the New Jersey Electric RR., better known as the Rutherford road. This company operates about 40 miles of electric road, and has been in the hands of a receiver for some time. John L. Heims, President of the company, is Receiver. (Hoboken, Jan. 11, 1898, p. 112.)

READING, PA.—The Reading Traction has secured control of the Reading & Southwestern Ry. Co. This was done at the annual meeting of the R. & S. W. RR. Co. in Reading, Jan. 9, when Geo. W. Keim was elected President of the R. & S. W. Ry. The officers elected were: President, Mr. Keim, succeeding J. W. Shepp; Directors, G. Fred. Mertz, E. H. Deysher, H. C. Geissler, W. K. Stevens, Frank K. Flood, Levi Quier, Jas. A. O'Reilly and L. T. Custer. Mr. Keim, the new President, was the projector of the R. & S. W. Ry. The R. & S. W. was incorporated Nov. 18, 1890, and operates seven miles of electric railroad. The authorized capital stock is $130,000, all of which is issued. The funded debt is $57,900. The Reading Traction, which operates 31 miles of electric road, was chartered in 1893, and is leased to the Union Traction Co.

WASHINGTON, D. C.—According to report, Frederick C. Stevens and O. T. Crosby, President of the City & Suburban Ry., have bought the Capital Traction. These gentlemen have already acquired a controlling interest in the Anacostia & Potomac River RR. and the Belt Ry. Co. The Anacostia will be sold at auction on Jan. 16, and will no doubt be bought in by Mr. Crosby.

The Columbia Ry. Co. has issued a mortgage for $500,000 to the American Surety & Trust Co. of New York to meet the cost of change of road from cable to underground electric and for new equipment of cars. Nathaniel Wilson, President. (Dec. 23, p. 925.)

WYANDOTTE, MICH.—The Wyandotte & Detroit River Ry. has given a mortgage to the Union Trust Co. to secure an issue of $425,000 of bonds. The bonds are for 20 years, and dated Dec. 1, 1898. Part of the new issue is to retire a former mortgage on the property, which matures in 1903, and the balance will be used in improving the road, buying new cars, etc. The bonds already issued by the company amount to $200,000. The W. & D. R., which is 10½ miles long, was recently reported sold to J. C. Hutchins, Vice-President and Treasurer of the Detroit Citizens' Ry. Co. (Dec. 16, p. 906.)

ZANESVILLE, O.—The Zanesville Ry. & Electric Co.'s line was sold at auction in Zanesville Jan. 3 for $75,000 to J. B. Graham, of Boston, the trustee of the first mortgage bondholders. (Dec. 2, p. 870.)

The Zanesville Electric Ry. was incorporated Dec. 31. The incorporators are: James R. Garfield, Harry A. Garfield, Frank C. Howe, Frank J. Pool and Max Rudolph. It is believed to be for the reorganization of the Zanesville Ry. & Electric Co.

## TRAFFIC.

### Traffic Notes.

The number of cabin passengers landing at New York from European ships during the year 1898 was 80,586, which is 10,346 less than in 1897. The number of steerage passengers, 219,651, is 27,647 more than in 1897.

The Merchants' Association of New York has lately held its second annual meeting. President W. F. King presented his annual report, showing a resident membership of 1,237, a considerable increase during the year. The Association sent out during the year about 3,000,000 circulars to retail merchants, setting forth the advantages to be derived by purchasing goods in New York. The receipts of the Association during the year amounted to $73,439. Mr. King has secured for the coming season more extensive reductions of passenger fares than ever before.

The coal lands of the Lackawanna Iron & Steel Co., at Scranton, Pa., aggregating about 8,450 acres, have been sold to Joseph B. Dickson and others, who are interested in the New York, Ontario & Western, and who, it is said, will hereafter ship the product of the mines over that road. The capacity of the collieries now open on this property is about 800,000 tons yearly, and the total quantity of coal in the ground is estimated at 25 million tons. Hitherto a large portion of the coal mined has been used in the furnaces of the owners, though about 350,000 tons has been sold each year, and shipped over the Delaware, Lackawanna & Western.

### Chicago Traffic Matters.

Chicago, Jan. 11, 1899.

Not for a long time have freight rates from Chicago to the east been in such good condition. Since the first of the month local officers seem to have adhered strictly to tariffs. Among the western roads conditions are not so pleasant, although all tariffs are being better maintained than they were a month ago.

For the calendar year 1898 eastbound all-rail shipments from Chicago for the first time exceeded those by lake. The following table shows the eastbound business for the year as reported by the Board of Trade:

| | Total. | Per Cent. |
|---|---|---|
| Michigan Central | 381,166 | 8.4 |
| Wabash | 307,097 | 6.8 |
| L. S. & M. S. | 386,473 | 15.2 |
| P., Ft. W. & C. | 606,675 | 13.4 |
| P., C., C. & St. L. | 532,529 | 11.8 |
| B. & O. | 384,595 | 8.6 |
| C. & G. T. | 461,705 | 10.2 |
| N. Y. C. & St. L. | 442,146 | 9.8 |
| Chicago & Erie | 560,402 | 12.4 |
| C., C., C. & St L. | 155,421 | 3.4 |
| Totals | 4,518,209 | 100.0 |

The total, 4,518,209 tons, is to be compared with 3,203,383 tons in 1897. Lake shipments for the year aggregated 4,325,539 tons, as against 4,738,842 tons in 1897. The total rail aggregate of 4,518,209 tons is made up as follows: Flour and millstuffs, 572,182; grain, 2,219,024; cured meats and lard, 725,730; dressed beef, 512,283; hides, wool, lumber, broom corn, butter, cheese and seeds, 488,990. Of grain, flour and millstuffs the lake took, in 1898, 4,242,333 tons, or 1,451,127 tons more than the rail lines.

Eastbound shipments of flour, grain and provisions from Chicago and Chicago junctions to and beyond the western termini of the Trunk Lines for the five weeks ending Jan. 5, amounted to 619,776 tons. This statement includes 167,497 tons of flour, 346,356 tons of grain, 105,909 tons of provisions. The following table shows the quantities carried by the respective roads:

| | |
|---|---|
| Baltimore & Ohio | 26,174 |
| Cleve., Cin., Chi. & St. Louis | 32,866 |
| Chicago & Erie | 57,762 |
| Chicago & Grand Trunk | 80,554 |
| Lake Shore & Mich. Southern | 76,204 |
| Michigan Central | 66,233 |
| New York, Chi. & St. Louis | 76,401 |
| Pitts., Cleve., Cin. & Chi. | 58,513 |
| Pitts., Ft. Wayne & Chi. | 81,486 |
| Wabash | 43,579 |
| Total | 619,776 |

Eastbound shipments from Chicago, as reported weekly by the Board of Trade, were for the five weeks ending Jan. 5th, 566,658 tons as compared with 379,453 tons for the corresponding period of last year. This total of 566,658 tons is made up of 144,005 tons of flour and mill stuffs, 235,566 tons of grain, 76,243 tons of provisions, 43,108 tons of dressed beef and 53,186 tons of miscellaneous freight. The several roads carried:

| | |
|---|---|
| Michigan Central | 42,139 |
| Wabash | 35,136 |
| Lake Shore & Mich. Southern | 84,551 |
| Pitts., Ft. Wayne & Chi. | 83,759 |
| Pitts., Cleve., Cin. & Chi. | 72,861 |
| Baltimore & Ohio | 32,503 |
| Chicago & Grand Trunk | 86,848 |
| New York, Chi. & St. Louis | 62,345 |
| Chicago & Erie | 52,821 |
| Cleve., Cin., Chi. & St. Louis | 13,747 |
| Total | 566,658 |

The statements of freight shipped eastward from Chicago are made up on two bases. The first five-week statement, given above, is that furnished by the Chicago Freight Committee. It covers only three principal classes of freight, and it includes only such shipments as are carried through to Buffalo, Pittsburg, Wheeling, etc.; but it includes shipments from all junctions in Cook County, and some other points, including all from the Elgin, Joliet & Eastern. The second statement does not include shipments from the junctions outside of the city, but it does include, practically all kinds of freight except live stock; and it shows the total shipments by the roads mentioned to all points, both through and local.